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PATENTS

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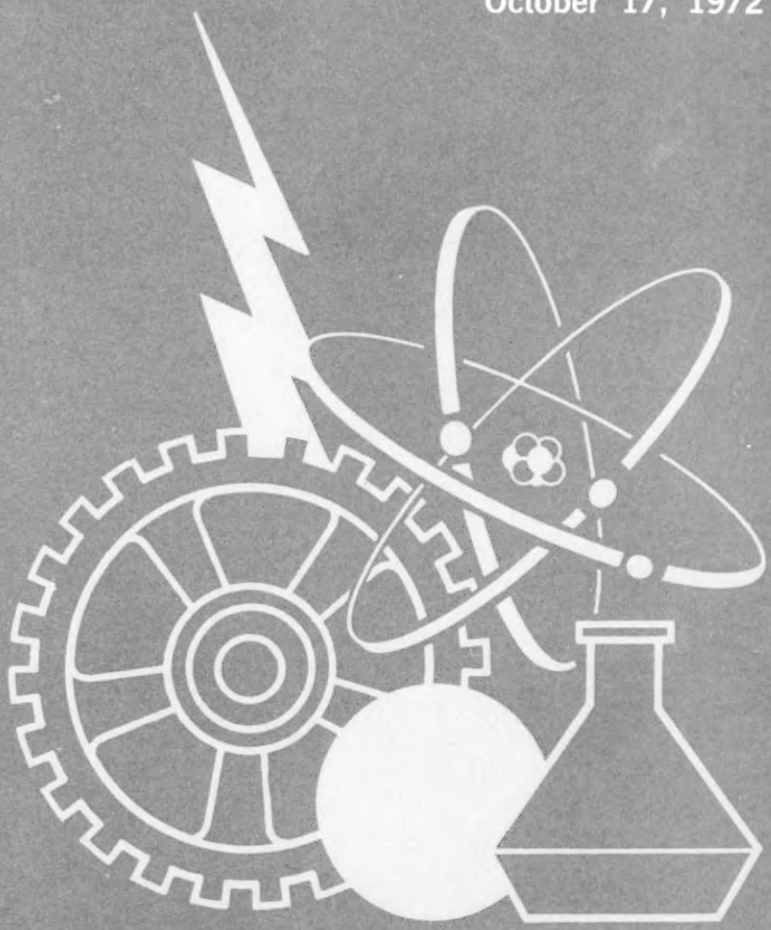

U. S. DEPARTMENT OF COMMERCE

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October 17, 1972 Volume 903 Number 3

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PATENT OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,587,568, P. Eisler, MANUFACTURE OF ELECTRIC CIRCUIT COMPONENTS; **3,706,697,** same, **filed** Sept. 21, 1962, D.C. Md. (Baltimore), Doc. 14084–W, *Technograph Printed Circuits, Ltd. and Technograph Printed Electronics, Incorporated* v. *Westinghouse Electric Corporation.* Opinion, ordered and adjudged that judgment be entered in favor of defendant, Mar. 20, 1972. **Same, filed** Dec. 19, 1962, D.C. Md. (Baltimore), Doc. 14299–W, *Technograph Printed Circuits, Ltd. and Technograph Printed Electronics, Incorporated* v. *U.S. International Telephone & Telegraph Corp.* Opinion, ordered and adjudged that judgment be entered in favor of defendant, Mar. 20, 1972. **Same, filed** Jan. 28, 1972, D.C. Md. (Baltimore), Doc. 14374–W, *Technograph Printed Circuits, Ltd. and Technograph Printed Electronics, Incorporated* v. *McDonnell Aircraft Corp.* Opinion, ordered and adjudged that judgment be entered in favor of defendant, Mar. 20, 1972. **Same, filed** Oct. 18, 1961, D.C. Md. (Baltimore), Doc. 13358, *Technograph Printed Circuits, Ltd. and Technograph Printed Electronics, Incorporated* v. *Martin-Marietta Corp.* Opinion, ordered and adjudged that judgment be entered in favor of defendant, Mar. 20, 1972.

3,706,697. (See 3,587,568.)

3,727,069, J. P. M. Van Waes, PREPARATION OF UREA, **filed** July 25, 1968, D.C. Del. (Wilmington), Doc. 3586, *Stamicarbon, N.V.* v. *Carolina Nitrogen Corp., Hercules, Inc., Lion Oil Co., Shell Chemical Corp., and Wycon Chemical Co.* Defendant Hercules, Inc. had infringed plaintiff's patent, and it is now stipulated and agreed by and between plaintiff and defendant pursuant to the terms of a settlement agreement that all remaining claims pending therein as to defendant Hercules, Inc. may be and is dismissed, Feb. 22, 1972.

3,746,291, R. C. Swengel, FLUID VELOCITY MEASURING SYSTEM, **filed** Apr. 18, 1968, D.C. Md. (Baltimore), Doc. 19419–W, *Robert C. Swengel, Sr.* v. *Westinghouse Electric Corporation.* Order that the complaint herein is dismissed with prejudice, Mar. 16, 1972.

3,090,605, Copeland and Neier, FEED MIXER, **filed** Mar. 2, 1972, D.C. Nebr. (Omaha), Doc. CV 72–0–167, *B/J Manufacturing Co., Inc.* v. *Creston Mfg. Co., Inc. and Norman Behrens.*

3,092,530, W. A. Plummer, HEAT PROTECTIVE SHEATHING; **3,467,761,** same, ELECTRICALLY SHIELDED HEAT-REACTIVE JACKET FOR CONDUCTORS, **filed** Aug. 4, 1970, D.C.N.J. (Newark), Doc. 1045–70, *Walter A. Plummer* v. *Herbert G. Bostrom, Arthur Johnson, Radcon Corp.* Consent judgment for permanent injunction, Feb. 7, 1972.

3,093,528, R. L. Reich, LABEL APPLYING MEANS, **filed** Dec. 22, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–3021–IH, *Compac Corporation* v. *John B. French, doing business as Better Built Engineering.* **Same, filed** Mar. 14, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–586–ALS, *Compac Corporation* v. *Synchro Electronics Inc.*

3,194,584, T. J. Reese, LOAD TRANSFERRING TRAILER HITCH, **filed** Mar. 29, 1966, D.C., N.D. Ind. (Hammond), Doc. 3787, *Terrell J. Reese and Reese Products, Inc.* v. *Elkhart Welding and Boiler Works, Inc.* Interlocutory judgment, patent is valid as to claims 5, 7 and 9; defendant enjoined, Dec. 19, 1969.

3,343,196, P. L. Barnhouse, SCRUB PUFF; **3,481,651,** same, APPARATUS FOR MAKING A SCRUB PUFF, **filed** Dec. 29, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–3060–F, *Paul L. Barnhouse* v. *Maywood Industries, Inc.*

3,415,360, Baumann and Beham, RECEPTACLE FOR DENTAL PREPARATIONS; **3,470,615,** E. J. Petner, DENTAL CROWNS FACED WITH POLYGLYCOL DIMETHACRYLATE AND PROCESS FOR MAKING; **3,471,596,** Petner, Baumann and Cornell, PROCESS OF MAKING FUSED THERMOSETTING DENTAL OBJECTS, **filed** July 29, 1970, D.C. Del. (Wilmington), Doc. C–3950, *Williams Gold Refining Co. Inc.* v. *Dentsply International Inc.* Stipulation of dismissal without prejudice, Jan. 3, 1972.

3,420,693, Scholes andl Pickard, GLASS HAVING DUAL PROTECTIVE COATINGS THEREON AND A METHOD FOR FORMING SUCH COATINGS, **filed** Feb. 18, 1972, D.C., S.D. Ill. (Springfield), Doc. S–C–72–27, *Ball Brothers Service Corporation* v. *Indian Head Inc.*

3,444,865, G. F. De Vita, TRANSFORMATION WIG, **filed** Oct. 12, 1971, D.C., N.D. Ohio (Cleveland), Doc. 71–1012, *Carousel Fashions, Inc.* v. *The Higbee Company.* Stipulation and order dismissing case with prejudice as regards the defendant per se but it is not to be construed as prejudicial against any supplier of defendant with respect to the subject matter of this litigation, Feb. 29, 1972. **Same, filed** Feb. 3, 1972, D.C., S.D.N.Y., Doc. 72–C–502, *Carousel Fashions, Inc.* v. *Paragon Hair Goods, Ltd. (Inc.).* **Same, filed** Feb. 11, 1972, D.C., W.D. Mo. (Kansas City), Doc. 20104–4, *Carousel Fashions, Inc.* v. *Eva Gabor's International Wigs Boutique, Ltd.*

3,447,351, C. W. Werntz, ROLL FORMING MACHINE INCLUDING DIVIDED ROLL PARTS AND SPACERS THEREFOR, **filed** May 18, 1971, D.C., E.D. Mo. (St. Louis), Doc. 71C314(2), *The Lockformer Co.* v. *Engel Equipment, Inc.* Plaintiff's complaint dismissed (pending on counterclaim), Nov. 12, 1971. Defendant Engel Equipment, Inc. redesignated as plaintiff and The Lockformer Co., plaintiff redesignated as defendant, Dec. 7, 1971. Patent valid and a verdict finding issues in favor of plaintiff Engel Equipment, Inc. and against defendant The Lockformer Co., Feb. 18, 1972.

3,467,761. (See 3,092,530.)

3,470,615. (See 3,415,360.)

3,471,596. (See 3,415,360.)

3,481,651. (See 3,343,196.)

3,482,730, S. G. Podwalny, FREE SWING WASTE RECEPTACLE COVER, **filed** Nov. 30, 1971, D.C., E.D. Mo. (St. Louis), Doc. 71C739(4), *Rubbermaid Incorporated* v. *Continental Manufacturing Company.*

3,486,981, R. E. Speck, SUBSTANCES RELATING TO TESTING OF BLOOD-COAGULATION, **filed** Mar. 3, 1972, D.C.N.J. (Trenton), Doc. C–427–72, *Ortho Hospital Supply Corporation, etc.* v. *American Hospital Supply Corporation, etc.*

3,487,221, L. M. Frank, LIGHT ACTIVATED TRIGGER FOR PHOTOGRAPHIC FLASH SYSTEM, **filed** Apr. 28, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1010, *The Lase Co.* v. *Introl Corp.* By stipulation of the parties, order case dismissed without prejudice, Feb. 17, 1972.

3,503,084. (See D. 216,525.)

3,509,484, P. Basse, DIGITAL FREQUENCY COUNTING AND DISPLAY APPARATUS FOR TUNABLE WIDE BAND SIGNAL GENERATORS, **filed** Mar. 17, 1972, D.C., S.D.N.Y., Doc. 72–C–1139, *Logimetrics, Inc.* v. *The Singer Company.*

3,513,668, M. Mintz, TUBULAR KNIT FABRIC, filed Jan. 24, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–72, *Industrial Knitting Corporation* v. *C & K Manufacturing Sales Company.*

3,542,663, S. Alewitz, ANODE FITTING, **filed** Mar. 9, 1972, D.C., S.D. Ohio (Trenton), Doc. 8337, *Perfection Corporation* v. *Magnode Products, Inc.*

3,550,582, T. Zimmerman, MOISTURE-PROOF COMBUSTIBLE CARTRIDGE CASE, **filed** Feb. 9, 1972, U.S. Ct. of Cl., Washington, D.C., Doc. 45–72, *Theodore Zimmerman* v. *The United States.*

3,560,979, D. A. Boelter, METHOD AND ELECTRICAL CIRCUIT FOR PROCESSING AIRPORT RUNWAY LOCALIZER AND GLIDESLOPE INFORMATION, **filed** Aug. 6, 1971, D.C., S.D. Tex. (Houston), Doc. 71–H–865, *General Aviation Electronics, Inc.* v. *Van Dusen, Inc. and Narco Scientific Indus-*

tries, Inc. Consent decree and order of dismissal under Rule 41(a)(1)(i). Patent valid, plaintiff owner and defendant has infringed and is enjoined, Mar. 20, 1972.

3,575,196, Marrese and O'Sullivan, CLOSED EXHAUST DISCHARGE SYSTEM FOR ANESTHESIA MACHINES, filed Jan. 20, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c161, *Rocco Anthony Marrese and William T. O'Sullivan* v. *Richard's Medical Equipment Inc.* Same, filed Jan. 20, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c162, *Rocco Anthony Marrese et al.* v. *Air Reduction Co.*

Service by Publication

John Hudnall

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on October 1, 1970, of an application for patent entitled "Method of Unassisted Friction-Resistive Exercising," on behalf of John Hudnall, whose last known address is 1817 23rd Ave., San Francisco, Calif., 94107. The application was filed as a Streamlined Continuation of an application earlier made in compliance with Rule 47(a) and 35 U.S.C. 116 by joint inventor Edgar E. Holkesvick without execution by the said John Hudnall. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said John Hudnall in connection with the present application must be taken within 30 days of the publication of this notice.

RICHARD A. WAHL,
Sept. 22, 1972. *Assistant Commissioner of Patents.*

Certificates of Correction for the Week of Oct. 17, 1972

D. 223,829	3,626,977,	3,645,240	3,668,246
3,394,518	3,627,015	3,646,013	3,668,358
3,459,461	3,627,119	3,646,088	3,669,126
3,516,853	3,627,220	3,648,153	3,669,177
3,542,841	3,627,228	3,649,497	3,669,217
3,550,371	3,627,711	3,649,578	3,669,368
3,554,360	3,628,310	3,649,876	3,669,626
3,573,300	3,628,331	3,649,891	3,669,649
3,573,863	3,628,403	3,650,293	3,669,706
3,580,403	3,628,909	3,650,816	3,669,819
3,580,664	3,629,547	3,652,583	3,669,947
3,588,344	3,629,611	3,653,277	3,670,678
3,590,687	3,629,711	3,654,944	3,670,872
3,594,343	3,630,043	3,656,002	3,671,063
3,594,503	3,630,467	3,656,453	3,671,438
3,596,306	3,630,548	3,656,666	3,671,608
3,600,847	3,630,745	3,657,528	3,671,780
3,600,996	3,631,185	3,658,427	3,671,851
3,601,683	3,631,266	3,658,460	3,672,147
3,601,687	3,631,325	3,658,660	3,672,359
3,602,695	3,631,398	3,658,776	3,672,453
3,602,851	3,631,676	3,658,850	3,672,564
3,604,374	3,631,797	3,658,949	3,672,759
3,605,536	3,631,948	3,659,334	3,672,796
3,607,252	3,632,230	3,659,665	3,672,919
3,611,883	3,633,442	3,660,488	3,673,003
3,614,467	3,633,865	3,660,731	3,673,318
3,614,744	3,633,998	3,660,898	3,673,789
3,615,308	3,634,620	3,661,275	3,674,068
3,616,669	3,634,793	3,661,768	3,674,316
3,618,232	3,635,746	3,661,790	3,674,404
3,620,763	3,635,795	3,662,578	3,674,488
3,620,767	3,636,239	3,662,713	3,674,556
3,621,888	3,636,731	3,662,975	3,674,740
3,621,954	3,637,375	3,664,460	3,675,240
3,622,064	3,637,666	3,664,477	3,675,442
3,622,109	3,638,215	3,664,992	3,676,138
3,622,184	3,639,789	3,666,370	3,676,291
3,622,682	3,640,618	3,666,618	3,676,424
3,623,765	3,641,046	3,667,100	3,676,629
3,624,085	3,641,553	3,667,596	3,676,736
3,624,528	3,642,072	3,667,687	3,677,225
3,625,020	3,643,569	3,667,824	3,678,147
3,625,728	3,643,620	3,667,847	3,678,306
3,625,831	3,644,739	3,667,848	
3,626,881	3,645,168	3,668,162	

Patents Withdrawn from the Register

General Electric Company hereby withdraws the following 6 patents from the Register of Patents Available for Licensing or Sale. The patents were listed as being available in the OFFICIAL GAZETTES as indicated below:

3,427,880. OVERHEATING DETECTOR FOR GAS COOLED ELECTRIC MACHINE. July 29, 1969.

3,573,460. ION CHAMBER DETECTOR FOR SUBMICRON PARTICLES. Feb. 22, 1972.

2,728,840. SPECIMEN HEATING MEANS. June 20. 1961.

2,761,068. AUTOMATIC POLE FIGURE RECORDER. Aug. 1, 1961.

3,100,261. X-RAY ANALYZING APPARATUS. June 29, 1965.

3,143,652. METHOD FOR MAKING A COLLIMATOR. June 29, 1965.

Patents Available for Licensing or Sale

3,369,256. HOSPITAL ROBE. Alice Kern, 419 W. 8th Ave., Tarentum, Pa., 15084.

3,420,560. MASONRY WALL JOIST HANGER. Jerome Pfahning, 526 William St., Key West, Fla., 33040.

3,514,117. SIMULATED ANIMAL BICYCLE. Paul J. Olsen, 19511 Almaden Road, San Jose, Calif., 95120.

3,544,103. RESILIENT CRADLE APPARATUS. Milo G. Conable, 5356 15th Ave., Sacramento, Calif., 95820.

3,567,218. BENDING EXERCISING DEVICE. Edwin S. Johnson, Chokio, Minn., 56221.

3,571,586. AN ARTIFICIAL CHRISTMAS TREE WITH INTEGRAL LIGHTING MEANS. Hugh L. Duckworth, 3305 W. Palmer St., Chicago, Ill., 60647.

3,591,925. LINE ANGLE DEGREE LEVEL INSTRUMENT. Frank Dupin, Box 109, Gurnee, Ill., 60031.

3,605,384. BREAKAWAY HALTER. Edo Pacini, 17494 Ehle St., Castro Valley, Calif., 95120.

3,606,555. TOOTHBRUSH HANDLE FOR INTERCONNECTING A BRISTLED HEAD AND A PRESSURED TOOTHPASTE CONTAINER. Tomas Ferro, 533 Grand St., Alameda, Calif., 94501.

3,650,522. MECHANICAL CLAMPING DEVICE IN PARTICULAR MACHINE VISE. Charles Wermuth and Heinz Wagner. Correspondence to: Woodhams, Blanchard & Flynn, 2026 Rambling Road, Kalamazoo, Mich., 49008.

3,651,650. APPARATUS FOR MAKING UNDERGROUND PASSAGES. Bruno Weiss, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,651,712. MOBILE DRIVE MECHANISM SUITABLE FOR STEERING TRACKED OR MULTIPLE-WHEELED VEHICLES. John L. Davis, 3228 Pillsbury Ave. S., Minneapolis, Minn., 55408.

3,666,936. ANIMATED DISPLAY SIGN. Ernst N. Jarke, 8467 Everglade Drive, Sacramento, Calif., 95826.

3,667,160. DEVICES FOR INDIVIDUAL AUTOMATIC PARKING IN LOTS AND IN THE STREETS. Charles R. Sailoum, 120 Ellis St., #307, San Francisco, Calif., 94102.

3,668,625. TRAFFIC MONITORING SYSTEM. David Wolf and Edward Blank. Correspondence to: Wolf, Greenfield & Sacks, 185 Devonshire St., Boston, Mass., 02110.

3,668,841. ANTI-POLLUTION CHAMBER. Howard R. Nunn, 2397 Main St., Napa, Calif., 94558.

3,669,294. SAFETY CLOSURES. Claude Petronelli et al., Wanganui, New Zealand. Correspondence to: Holman & Stern, 2401 15th St. N.W., Washington, D.C., 20009.

3,671,036. GOLF TEE SETTER. Joseph Rubino, Earlton, N.Y., 12058.

3,675,785. POSITIONABLE CLOTHESLINE SUPPORT. Calvin C. Martin, P.O. Box 3516, Visalia, Calif., 93277.

3,679,213. TRANSPARENT CONTAINER AND LETTERED CUBES PUZZLE. Vladimir Moss, 10463 Ambassador Drive., Rancho Cordova, Calif., 95670.

3,679,471. METHOD FOR THE PRODUCTION OF ELECTRICAL RESISTOR BODIES, AND ELECTRICAL RESISTOR BODIES PRODUCED IN ACCORDANCE WITH SAID METHOD. Hugo Wyss. Correspondence to: Werner W. Kleeman, Suite 212, Crystal Plaza 1, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

The following 2 patents are offered by: George J. Miller, 2441 Arthur St., Hollywood, Fla., 33020.

3,507,496. PITCHING GAME.

3,668,803. BALL ROLLING TOY.

The following 2 patents are offered respectively for Yvette B. Kopp and Jack D. Jackson by James B. Lake, Rault Center, New Orleans, La., 70112.

3,608,704. COMBINED CIGARETTE LIGHTER CASING AND SLIDABLE CLOSURE.

3,619,596. ILLUMINATING COMPACT AND LIGHT SOURCE.

The Sam P. Wallace Co., Inc., is prepared to grant nonexclusive licenses under the following patent upon reasonable terms to any and all persons, firms, corporations, and un-incorporated associations.

Applications for licenses may be addressed to Sam P. Wallace Co., Inc., 2102 Proctor St., P.O. Box 35828, Dallas, Tex., 75235.

3,669,349. AIR FLOW CONTROL SYSTEM.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 46 patents.

Inquiries respecting licenses should be addressed to: RCA Corporation, Staff Vice Pres., Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,199,939. PHOSPHOR DEPOSITION.
3,426,221. THERMIONIC CONVERTER.
3,428,773. IN-LINE, HIGH TEMPERATURE, HIGH VACUUM CLOSURE.
3,673,652. FILAMENTARY DISPLAY DEVICES.
3,673,983. HIGH CAPACITY DEPOSITION REACTOR.
3,674,342. LIQUID CRYSTAL DISPLAY DEVICE INCLUDING SIDE-BY-SIDE ELECTRODES ON A COMMON SUBSTRATE.
3,674,488. METHOD OF MAKING MATCHING PHOTOPRINTING MASTERS.
3,674,551. FORMATION OF OPENINGS IN INSULATING LAYERS IN MOS SEMICONDUCTOR DEVICES.
3,674,568. HYBRID THERMOELECTRIC GENERATOR.
3,674,921. THREE-DIMENSIONAL TELEVISION SYSTEM.
3,674,932. AUTOMATIC BEAM CURRENT LIMITER.
3,675,095. CAPACITORS OF CONSTANT CAPACITANCE.
3,675,096. NON AIR-POLLUTING CORONA DISCHARGE DEVICES.
3,675,134. METHOD OF OPERATING AN INFORMATION STORAGE TUBE.
3,675,144. TRANSMISSION GATE AND BIASING CIRCUITS.
3,676,082. MAGNETIC COMPOSITIONS.
3,676,129. METHOD FOR MAKING A LIGHT INTENSITY CORRECTION FILTER.
3,676,229. METHOD FOR MAKING TRANSISTORS INCLUDING BASE SHEET RESISTIVITY DETERMINING STEP.
3,676,252. METHOD OF ELECTRICALLY MOUNTING COMPONENTS IN HYBRID CIRCUITS.
3,676,590. DECODERS AND COUPLING CIRCUITS FOR SOLID STATE VIDEO PICKUP.
3,676,610. MAGNETIC HEAD WITH MODIFIED GRAIN BOUNDARIES.
3,676,702. COMPARATOR CIRCUIT.
3,676,705. LOGIC CIRCUITS EMPLOYING SWITCHES SUCH AS FIELD-EFFECT DEVICES.
3,676,711. DELAY LINE USING INTEGRATED MOS CIRCUITRY.
3,677,505. TAPE WINDING MECHANISM.
3,677,848. METHOD AND MATERIAL FOR ETCHING SEMICONDUCTOR BODIES.
3,678,180. RADIO FACSIMILE POSTAL SYSTEM FOR MULTIPLE ADDRESSEES.
3,678,292. MULTI-FUNCTION LOGIC GATE CIRCUITS.
3,678,403. BALANCED VARIABLE GAIN AMPLIFIER.
3,678,405. AMPLIFIER-LIMITER CIRCUIT WITH REDUCED AM TO PM CONVERSION.
3,678,406. VARIABLE GAIN AMPLIFIER.
3,678,407. HIGH GAIN MOS LINEAR INTEGRATED CIRCUIT AMPLIFIER.
3,678,418. PRINTED CIRCUIT BALUN.
3,678,995. SUPPORT FOR ELECTRICAL COMPONENTS AND METHOD OF MAKING THE SAME.
3,679,284. METHOD FOR FILLING AN EVACUATED ELECTRON TUBE WITH GAS TO ATMOSPHERIC PRESSURE.
3,679,379. MAGNETIC COMPOSITIONS.
3,679,816. CONTROL APPARATUS FOR A COLOR TELEVISION RECEIVER.
3,679,819. VIDEO BLANKING AND SOUND MUTING CIRCUIT EMPLOYING GROUNDED TUNER SWITCHES.
3,679,827. OPTICAL APPARATUS FOR CONTINUOUS TELEVISION FILM PROJECTION SYSTEM.
3,679,911. DECODER CIRCUIT.
3,679,942. METAL-OXIDE-METAL, THIN-FILM CAPACITORS AND METHOD OF MAKING SAME.
3,679,981. SYNCHRONOUS DEMODULATOR EMPLOYING COMMON BASE TRANSISTOR AMPLIFIER INPUT AND BASE-EMITTER CLAMPING ACTION.
3,679,982. SYNCHRONOUS DEMODULATOR EMPLOYING TRANSISTOR BASE-EMITTER CLAMPING ACTION.
3,679,989. CLAMP CIRCUIT FOR PREVENTING SATURATION OF OPERATIONAL AMPLIFIER.
3,680,060. ELECTRO-OPTICAL MEMORY EMPLOYING FERROELECTRIC ELEMENT.
3,680,068. ALARM CIRCUIT.

The General Electric Company is prepared to grant non-exclusive licenses under the following 63 patents upon reasonable terms to domestic manufacturers.

Applications for licensing under the following patent may be addressed to: Patent Counsel, General Electric Company, Box 237, G.P.O., Detroit, Mich., 48232.

3,481,825. DIRECT BONDING OF DIAMOND TO MOLYBDENUM.

Applications for licenses under the following patent may be addressed to: Patent Counsel, Telecommunication Products Department, General Electric Co., Lynchburg, Va., 24502.

3,649,769. IMPROVED CIRCUIT FOR SUPPLYING DIRECT CURRENT TO A TELEPHONE LINE.

Applications for licenses under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,676,943. NON-FLAMMABLE, THIN, INTEGRALLY ILLUMINATED CONTROL PANEL OVERLAY.

Applications for licenses under the following 2 patents may be addressed to the: Patent Counsel, Mobile Radio Department, General Electric Co., Lynchburg, Va., 24502.

3,662,459. METHOD FOR MANUFACTURING DISCRIMINATORS.
3,659,248. COMBINED SOCKET COVER AND PLUG RETAINER.

Applications for license under the following 10 patents may be addressed to: Francis K. Richwine, Patent Counsel, Ordnance Systems Department, General Electric Co., 100 Plastics Ave., Pittsfield, Mass., 01201.

3,352,718. SEA WATER-ACTIVATED PRIMARY BATTERY.
3,431,479. PHASE CONTROLLED POWER AMPLIFIER LOCKOUT CIRCUIT.
3,535,025. MOSAIC PRISM STRUCTURE.
3,401,567. GYROSCOPES.
3,449,961. OPTICAL READOUT SYSTEMS.
3,382,023. MULTIPLE APERTURE ROOF PRISM.
3,508,252. ANALOG TO DIGITAL AND DIGITAL TO ANALOG SIGNAL CONVERTERS.
3,456,511. STBILIZATION CONTROL SYSTEM.
3,338,643. HYDROSTATIC BEARING.
3,525,029. PULSE WIDTH MODULATION POWER SWITCHING SERVO AMPLIFIER AND MECHANISM.

Applications for licenses under the following 11 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40225.

3,440,308. METHOD OF MAKING A REFRIGERATOR CABINET ASSEMBLY.
3,459,011. COMPENSATED CONTROL FOR ELECTROMAGNETIC CLUTCH.
3,463,285. ELECTRIC CLUTCH WITH SPEED CONTROL.
3,514,964. ICEMAKER WITH IMPROVED ICE STORAGE RECEPTACLE.
3,621,684. CHILD SAFE FREEZER.
3,653,224. ICE SERVICE FOR HOUSEHOLD REFRIGERATORS.
3,656,203. CASTER AND CASTER BRAKE STRUCTURE FOR APPLIANCES AND THE LIKE.
3,659,696. LIVE ROLLER CONVEYOR.
3,662,197. COMBINATION MOTOR-CLUTCH APPARATUS.
3,670,521. SIDE-BY-SIDE REFRIGERATOR.
3,670,533. LIQUID FILL CONTROL.

Applications for license under the following 11 patents may be addressed to: Patent Counsel, General Electric Co., Wiring Device Business Department, 95 Hathaway St., Providence, R.I., 02904.

3,446,991. ALTERNATING CURRENT SWITCH.
3,447,067. HYSTERESIS FREE PHASE CONTROL CIRCUIT USING SILICON BILATERAL SWITCH.
3,467,939. GROUNDING STRAP IMPROVEMENT FOR ROUND GROUNDING OUTLET.
3,467,941. DUPLEX SOCKET CONTACT WITH BREAK-OFF TAB.
3,489,985. CONTINUOUS CAM CONTACT FOR CONVENIENCE OUTLET.
3,493,848. PHASE ANGLE CONTROL CIRCUIT USING SBS.
3,532,846. COMBINED PUSH-IN AND SCREW TERMINAL CONTACT.
3,562,627. LOW HYSTERESIS FIRING CIRCUIT FOR SOLID STATE SWITCH.
3,566,337. DUPLEX LOCKING RECEPTACLE WITH ISOLATED THIRD WIRE.
3,573,567. SOLID STATE SWITCH HOUSING.
D. 220,186. CASING FOR CAPS AND CONNECTORS.

Applications for license under the following 16 patents may be addressed to: General Electric Co., Nuclear Energy Division, 175 Curtner Ave., San Jose, Calif., 95114. Attention: Patent Counsel.

2,741,410. METHOD AND APPARATUS FOR HANDLING CONTAMINATED GLOVES.
3,094,621. IDENTIFYING PLANT AND ANIMAL DEFICIENCIES BY RADIOACTIVE MEANS.

3,178,355. REACTOR LEAK DETECTOR USING FILTERS.
3,221,165. DEVICE FOR MEASURING BIOLOGICAL EFFECT OF RADIATION.
3,271,691. RADIATION MONITOR CIRCUIT INCLUDING AMPLIFIER.
3,311,770. GAMMA COMPENSATED NEUTRON ION CHAMBER.
3,373,688. PUMPS.
3,375,402. NEON LAMP WARNING CIRCUIT.
3,395,781. VELOCITY LIMITER.
3,400,047. JET PUMPING SYSTEM FOR A NUCLEAR REACTOR.
3,520,989. PRESSURE CONTAINMENT ELECTRICAL PENETRATION ASSEMBLY.
3,533,863. PROCESS FOR PRODUCING APERTURED BODY COMPRISING CASTING AN ALLOY, PLASTICALLY DEFORMING THE CAST ALLOY, AND ETCHING TO REMOVE ONE OF ALLOYS, AND BODY PRODUCED THEREBY.
3,566,145. RECTIFIER CIRCUIT.
3,594,134. PROCESS FOR PRODUCING POROUS METAL FILMS AND ARTICLES PRODUCED THEREBY.
3,594,292. PROCESS FOR PRODUCING ARTICLES WITH APERTURES OR RECESSES OF SMALL CROSS-SCETION AND ARTICLES PRODUCED THEREBY.
3,621,926. NUCLEAR REACTOR COOLANT RECIRCULATION SYSTEM.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 19, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-01-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-06-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-15-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	1-26-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-01-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-18-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	8-11-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	6-24-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-18-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-30-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-29-71

Expiration of patents: The patents within the range of numbers indicated below expire during October 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,719,294 to 2,721,998, inclusive
Plant Patents..... Numbers 1,423 to 1,426, inclusive

PATENTS

GRANTED OCTOBER 17, 1972

GENERAL AND MECHANICAL

3,698,014

COMBINATION JACKET AND HOOD

John W. Little, Hinsdale, and Thaddeus J. Cebula, Lombard, both of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,379
Int. Cl. A41d *3/00*
U.S. Cl. 2—84 **1 Claim**

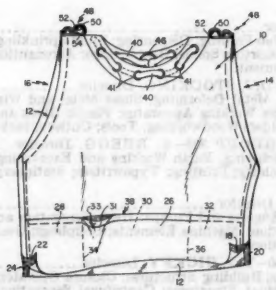
A combination jacket and hood in which the hood is attached to the neckline of the jacket by a strip of flexible fabric which permits the hood to move relative to the jacket.

3,698,015

ARTICLE OF CLOTHING

Bernardine J. Richards, 9 West Street, Plymouth, Mass., and Bernadette T. O'Neil, 62 Ludlam Street, Lowell, Mass.

Continuation-in-part of Ser. No. 67,350, Aug. 27, 1970. This application July 13, 1971, Ser. No. 162,085
Int. Cl. A41d *1/22*
U.S. Cl. 2—105 **4 Claims**



A sleeveless, waist-length garment which includes sealing means extending from the arm openings to the waist opening at the side edges of front and back garment panels. The garment includes a lining in at least one of the panels. The lining is permanently secured to the panel along the waistline edge of the panel as well as along the sides of the panel. Along the neck opening of the garment, however, the lining is not attached to the panel. There is also provided a decorative draw cord which is disposed around substantially the entire neck opening of the garment.

3,698,016

CLOTH ARTICLE PROVIDED WITH TEST TAB

Rupen L. Saddler, 161 Churchill Road, Tenafly, N.J.

Continuation-in-part of Ser. No. 18,387, Feb. 26, 1970. This application April 8, 1971, Ser. No. 132,375
Int. Cl. A41d
U.S. Cl. 2—243 R **8 Claims**

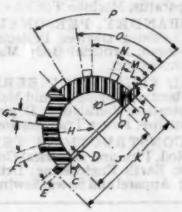
An article includes a panel of material, e.g., textile fabric or plastic, having a tab projecting from one edge of the panel, the edge forming part of a seam of the article so that the tab projects from the seam. The panel and tab are a single piece of material. The article may be a garment and the tab may project into the interior of the garment. The tab may be removed when desired to serve as a specimen for testing some characteristic of the article material. The length and width dimensions of the tab are at least as large as those required by generally accepted standards for testing flame resistance of cloth.

3,698,017

PROSTHETIC ACETABULAR DEVICES

John Tracey Scales, Stanmore, and David Goddard, Kings Langley, both of England, assignors to National Research Development Corporation, London, England

Filed July 29, 1970, Ser. No. 59,085
Claims priority, application Great Britain, Aug. 11, 1969, 40039/69
Int. Cl. A61f *1/00, 1/24*
U.S. Cl. 3—1 **5 Claims**



A prosthetic acetabular device of generally hemispherical cup form has for cement fixation, a plurality of annular ribs formed around its outer surface, the ribs extending from a minor proportion of such surface. The ribs preferably are parallel to the cup rim, have undercut side walls, and have transverse passages to facilitate cement flow except for the rib nearest the cup rim. The device was initially designed for manufacture from plastics material, but in a subsequently preferred form is of metal with a liner cup of plastics material.

3,698,018

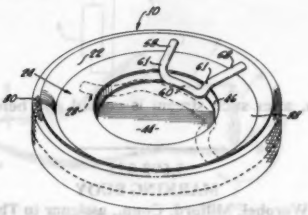
PIVOTED DISCOID HEART VALVE HAVING A CHANGING PIVOT AXIS

Donald P. Shiley, 11022 Huntington, Santa Ana, Calif.

Continuation of Ser. No. 809,754, March 24, 1969, abandoned. This application May 6, 1971, Ser. No. 140,900

Int. Cl. A61f 1/22

U.S. Cl. 3—1 **23 Claims**



A heart valve prosthesis having a discoid poppet mounted therein for pivotal movement between a closed and opened position. The poppet is supported for movement by opposed, spaced support struts which form an eccentric pivot point for opening of the valve and a changing pivot point for closing of the valve. The spacing between the struts is sufficient to enable rotational movement of the poppet during operation.

3,698,019

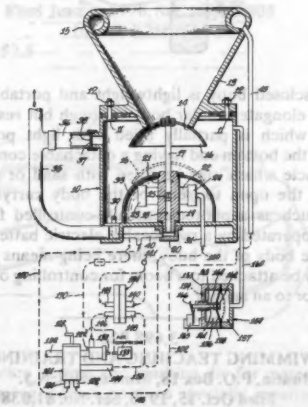
PRESSURE DISCHARGE WASTE DISPOSAL APPARATUS

Duane Culp, P.O. Box 345, North Lima, Ohio

Filed July 2, 1971, Ser. No. 159,404

Int. Cl. E03d 7/36, 1/30, 3/10

U.S. Cl. 4—10 **13 Claims**



The present invention is an improvement on the construction shown in U.S. Pat. No. 3,566,415, issued to me on Mar. 2, 1971. The toilet structure is substantially the same as in the patent and the improvement resides in controls for water and air used in flushing the toilet and removing waste therefrom.

3,698,020

MANIFOLD BODY FOR A MULTI-PERSON SHOWER ASSEMBLY

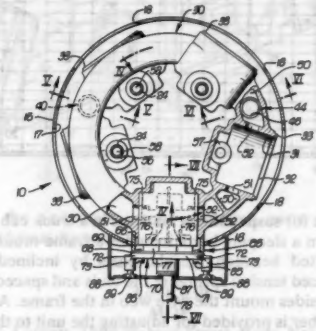
Earl L. Morris, 1501 North Cloister Road, Whittier, Calif.

Filed Aug. 21, 1970, Ser. No. 65,943

Int. Cl. A47k 17/00

U.S. Cl. 4—145 **7 Claims**

A generally cylindrical one-piece manifold body mounted in a hollow vertical housing with a plurality of shower heads to provide a multi-person shower assembly has a cylindrical configuration with a plurality of circumferentially, equally spaced chambers opening outwardly to receive a mixing valve in each chamber, hot and cold water inlets connected to hot and cold water supply pipes, hot and cold water manifold passages connecting their respective inlets with each chamber through ports, and outlet means from each chamber for passing hot and cold water, properly mixed to a desired temperature by the valve in the chamber, through a tube to the respective shower head. A ring extension is provided over each chamber to extend through an opening in the housing for increasing the effective depth of the chamber without increasing the diameter of the body between the chambers. The outlet means has upper or lower outlets therein to permit the body to be mounted with either axial side up to accept supply pipes extending from either the ceiling or the floor.



3,698,021

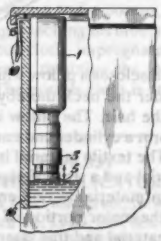
AUTOMATIC TOILET BOWL CLEANER DISPENSER

Frank Joseph Mack, Miamiville, and Terry John Simpkins, Dublin, both of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Feb. 17, 1970, Ser. No. 12,039

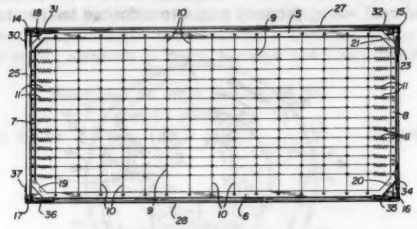
Int. Cl. E03d 9/02

U.S. Cl. 4—227 **8 Claims**



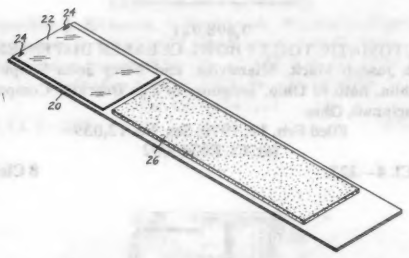
This invention relates to a dispenser for releasing a measured amount of fluid into the flush tank of a toilet. The dispenser consists of a container having an open neck, a shroud which fits over the neck and restricts the discharge opening in the neck, and a float member slidably connected to the shroud which in one of its positions seals the discharge opening. A measuring chamber is formed in the float element in direct communication with the discharge opening. The entire container is inverted in the toilet flush tank in such a manner that the float member rises and falls with the flushing action of the toilet. In the upper position the float member closes the discharge opening and in the lower position the measuring chamber fills with fluid. As the float member rises after the measuring chamber is filled, the fluid is forced out of the chamber through openings therein and into the toilet flush tank.

3,698,022
BUNK FOR A TRUCK CAB SLEEPING BERTH
Tom H. Knight, 7710 Popular, Commerce City, Colo.
Filed Dec. 28, 1970, Ser. No. 101,464
Int. Cl. B60p 3/32; A45f 1/00
U.S. Cl. 5—118 4 Claims



Apparatus for suspending a mattress in a truck cab cleeping berth to form a sleeping bunk includes a frame-mounted wire web supported between upright posts by inclined tension springs. Spaced tension springs at the ends and spaced anti-sag wires at the sides mount the wire web in the frame. A variable shock obsorber is provided for adjusting the unit to the weight of the user.

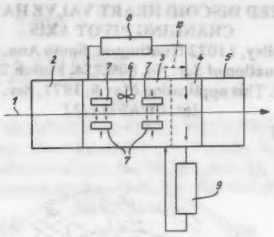
3,698,023
PILLOW AND METHOD OF MAKING
Alice R. Archbold, R. #1, Smith Road, Yoder, Ind.
Filed Jan. 4, 1971, Ser. No. 103,750
Int. Cl. A47g 2/00; A47c 27/00
U.S. Cl. 5—337 5 Claims



The specification discloses a pillow which is cylindrical so as to be receivable under the neck thereby to support the head without disturbing the hair. The pillow is made by rolling up textile material to form a cylinder and enclosing the pillow in a snugly fitting case. The textile material is in the form of a long strip of woven material and a strip of plastic material is placed on top of the woven material at one end and then a batt of fibers is placed on the major portion of the remainder of the length of a woven material and this assembly is then rolled up from the end having the plastic strip thereon so that the plastic strip is in the radially inner part of the pillow and forms stiffening means therefor.

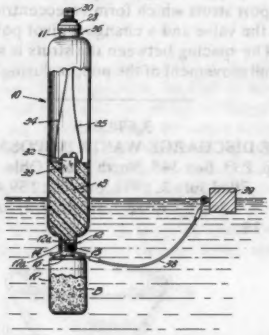
3,698,024
TREATMENT OF CONTINUOUS FABRIC WEBS
Kurt Bruckner, Michelstadt, Germany, assignor to Bruckner-Apparatebau Michelstadt GmbH, Erbach/Odenwald, Germany
Filed March 3, 1971, Ser. No. 120,530
Int. Cl. F23b 7/00; F26b 21/04
U.S. Cl. 8—151 3 Claims

The web is wet with a solvent, dried in a stream of circulating air in a drying chamber, and then cooled. A secondary stream of air is withdrawn from the circulating air, cooled in a condenser to recover solvent, reheated, and returned to the circulating air. The web leaving the drying chamber is precooled in a separate chamber by means of the secondary



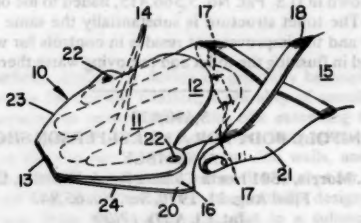
air stream, after such stream is cooled and before it is reheated.

3,698,025
MARKING BUOY
Walter J. Worobel, Milford, Conn., assignor to The Hitchcock Gas Engine Co., Inc., Bridgeport, Conn.
Filed Oct. 12, 1970, Ser. No. 79,938
Int. Cl. B63b 51/02
U.S. Cl. 9—8.3 E 1 Claim



The disclosed buoy is lightweight and portable and comprises an elongate tubular body of tough but resilient plastic material which is partially filled with light porous plastic material, the bottom end having a detachable connection with a receptacle which may be filled with sand or other ballast material, the open top end of the body carrying signaling means, such as a photoelectrically-controlled flashing light which is operated by a replaceable electric battery contained within the body of the buoy, there being means whereby the buoy may be attached to a boom for controlling oil spillage for instance or to an anchor.

3,698,026
SWIMMING TEACHING AND TRAINING AID
Jenry J. Buntin, P.O. Box 18, Murray Hill, N.J.
Filed Oct. 15, 1970, Ser. No. 81,038
Int. Cl. A63b 31/02
U.S. Cl. 9—308 6 Claims



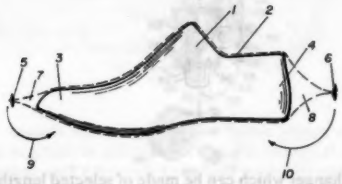
A special mitt aids teacher and competition swimmer in training by allowing near natural swimming with accentuation of errors or strength building with proper strokes.

3,698,027

MANUFACTURE OF ARTICLES OF FOOTWEAR

Johann Schwab; Kurt Buchel, both of Vienna; Otto Eder, Ternitz; Wladimir Hascic, Vienna; Maria Enzersdorf, Vienna, and Ludwig Marek, Vienna, all of Austria, assignors to SEMPERIT Aktiengesellschaft, Vienna, Austria

Filed Nov. 10, 1970, Ser. No. 88,376
Int. Cl. A43d 9/00
U.S. Cl. 12—142 R 29 Claims



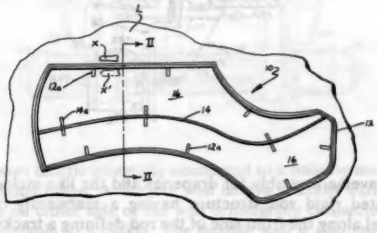
A process for the manufacture of an article of footwear comprising the steps of joining a sole to an upper of rough material to which the sole can be directly joined without further processing, and applying to the part of the upper which is not covered by the sole in the finished article at least one covering layer. The sole can first be joined to the upper, e.g., by injection moulding, and the covering layer subsequently applied, or the covering layer can first be applied to the upper leaving uncovered the lower edge region to which the sole is to be joined and the sole then joined to this region.

3,698,028

VISION EFFECTIVE CUTTING AND MARKING DIE

Peter D. Panter; Claude P-E. Denis, Grand Rapids, and Gerhard P. Kaempfer, Wyoming, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Filed June 4, 1970, Ser. No. 43,505
Int. Cl. B26f 1/46
U.S. Cl. 12—52.5 1 Claim



A combination cutting and marking die for materials such as leather, having marker portions specially mounted to the cutter portions with a resilient transparent polymeric material enabling the operator to rapidly cut and mark areas free of defects with total material observation.

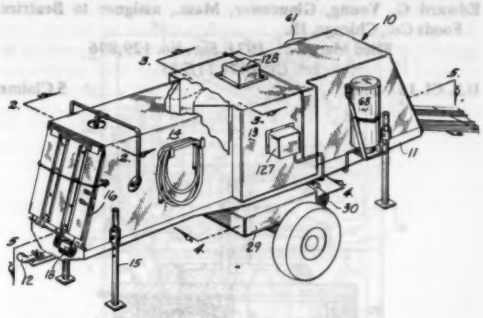
3,698,029

AUTOMATIC WASHING APPARATUS

William D. Pulliam, 15710 Rosalita Drive, La Mirada, Calif.

Filed Dec. 19, 1969, Ser. No. 886,678
Int. Cl. B60s 3/04
U.S. Cl. 15—21 D 3 Claims

Apparatus for automatically washing nestable shopping carts and the like. Automatic conveyor means separately engaging an undercarriage of each of a plurality of shopping carts for nested conveyance of the carts successively through a wash chamber and a rinse chamber of said apparatus. A plurality of rotatably mounted brushes, disposed about the conveyor means, are adapted to frictionally engage the moving carts in a scrubbing action. A counter-balanced, vertically movable and inclined array of wash nozzles forms a vertically-movable adaptable array, provided for accommodating and



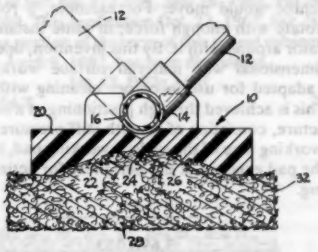
washing the undercarriage of shopping carts of different design and manufacture.

3,698,030

MOP

Eugene C. Lockett, 1580 Stewart Street, Reno, Nev.

Continuation-in-part of Ser. No. 874,151, Nov. 5, 1969. This application May 26, 1971, Ser. No. 146,899
Int. Cl. A47l 13/17, 13/46, 13/22
U.S. Cl. 15—104.94 14 Claims



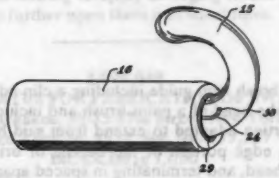
A mop member having a frame including a concave surface on the bottom of the frame and a porous, bristly material impaled upon protruding attaching members and adapted to trap soil and dust. A porous cloth, impregnated with oils, extends over the bristly material, retaining the loose soil and dust in the bristly material. The porous cloth is attached to the frame of the mop.

3,698,031

PAINT APPLICATOR

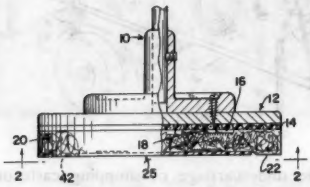
Mark Descant, 3617½ Iberville Street, New Orleans, La.

Filed March 14, 1969, Ser. No. 807,298
Int. Cl. B05c 1/06
U.S. Cl. 15—210 2 Claims



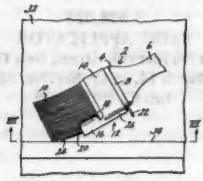
A hand operated handle which can be used for painting. The handle consists of two members; a piece of shaped plywood and a spring like wire. Both members being so arranged as to receive a detachable lambskin roller cover.

3,698,032
PRESSURE PLATE FOR CLEANING CARPETING WITH SURFACE WORKING PAD
Edward G. Young, Gloucester, Mass., assignor to Beatrice Foods Co., Chicago, Ill.
Filed March 31, 1971, Ser. No. 129,896
Int. Cl. A471 *11/283*
U.S. Cl. 15—230 5 Claims



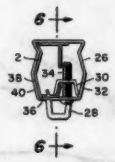
Improvements in the use of floor cleaning equipment utilizing the weight of the equipment to apply pressure to a worked surface through a surface working pad which is moved by the machine. Heretofore, if one were to attempt to use such machines on carpeting with surface working pads which are normally used for cleaning hard surfaces, e.g. nylon pads, the pads would remain stationary with respect to the carpet and the machine would move. For example, a rotary machine would rotate with enough force, in some instances, to throw an operator around with it. By this invention, open non-woven three-dimensional web material surface working pads are readily adapted for use in carpet cleaning with such equipment. This is achieved through positioning of a novel article of manufacture, consisting of smooth stiff pressure plate means, on the working face of the surface working pad, leaving a margin of the pad exposed at the periphery for acting upon a carpet or rug.

3,698,033
PAINT BRUSH TRIM GUIDF
Robert L. French, 1109 West 35th Street, Independence, Mo.
Filed Feb. 16, 1971, Ser. No. 115,584
Int. Cl. A46b *15/00*; B44d *3/22*
U.S. Cl. 15—246 3 Claims



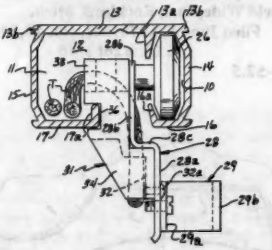
A paint brush trim guide including a clip adapted to be attached to the head of a paint brush and including a channel-shaped portion adapted to extend from said head to enclose therein an edge portion of the bundle of bristles extending from said head, and terminating in spaced apart relation from the free ends of said bristles, and a leaf spring guide member disposed in and extending along the base portion of said channel-shaped portion and extending outwardly therefrom to a point adjacent the free ends of said bristles.

3,698,034
CURTAIN HANGER
Hidehiro Endou, Noda and Takashi Yokota, Yokohama, both of Japan, assignors to Yokota Kinzoku Kogyo Co., Ltd., Tokyo, Japan
Filed Oct. 30, 1969, Ser. No. 872,585
Int. Cl. A47h *13/10*
U.S. Cl. 16—87.4 R 1 Claim



A curtain hanger which can be made of selected lengths and which avoids derailment or dragging of the runners. A selected number of standard length channel segments are interconnected by fishplates to provide for variable length hangers. The segments are provided with a trackway along the floor for guiding wheeled runners. A stop in the trackway prevents escape from the ends of the runners.

3,698,035
TRAVERSE ASSEMBLY FOR DRAPERIES AND THE LIKE
Ferdinand F. Salzmann, Madison, Wis., assignor to Consolidated Foods Corporation, Chicago, Ill.
Filed Aug. 30, 1971, Ser. No. 176,160
Int. Cl. A47h *1/04*, *15/00*; E05d *13/02*
U.S. Cl. 16—95 D 10 Claims

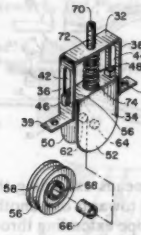


A traverse assembly for draperies and the like including an elongated rigid rod structure having a rearwardly opening channel along the front side of the rod defining a trackway for receiving drapery carriers, and a forwardly opening channel along the rear side of the rod defining a cord track, with the rear cord track spaced from the front carrier track to define an intermediate access passageway therebetween. Drapery carriers are mounted in the front carrier track to support draperies adjacent the front side of the rod and a master carrier is provided with followers that ride in the front carrier track and a rear guide means which slidably support the master carrier on the forward edge of the rear cord track to stabilize the master carrier during movement along the rod.

3,698,036
SLIDING STRUCTURE ROLLER ASSEMBLY
Martin M. Goodman, Tarzana, Calif., assignor to Columbia Belford Inc., Los Angeles, Calif.
Filed Oct. 14, 1970, Ser. No. 80,672
Int. Cl. A47h *15/00*
U.S. Cl. 16—100 7 Claims

Herein described is apparatus useful as roller assemblies for sliding structure such as a door or a window which engage

tracks in the door or window frames. The structure comprises a frame insertable within the outer frame of the sliding structure which is generally U-shaped and comprises a roller rotatably mounted within the U-shaped frame. A U-shaped support supports the roller within the frame and includes a pair of extensions which are insertable through slots within the



U-shaped frame on either leg thereof. Means disposable through the top of the frame engages the support structure for adjusting the limit of travel of the structure of the support within the U-shaped guide frame slots. A spring is included between this support and the frame to bias the wheel support and the wheel away from the frame.

3,698,037

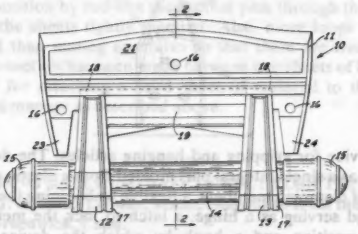
INTEGRAL CASKET HANDLE AND BASE WITH CONCEALED HINGE

Bennie R. Johnson, R. R. 3, Connersville, Ind.

Filed Dec. 30, 1970, Ser. No. 102,611

Int. Cl. A47b *95/02*; B65d *25/28*

U.S. Cl. 16—112 **8 Claims**



A casket handle integrally connected to a base by means of a concealed hinge. A flexible wall having laterally extending grooves on either side of the wall is integrally connected to a base securable to a casket. The flexible wall is also integrally connected to a second wall having arms and a carrying bar integrally attached thereto. A curved lip extends outward and downward from the base cooperatively with the second wall concealing the flexible wall when the carrying bar and arm are pivoted forward of the base.

3,698,038

SHELLFISH PROCESSING MACHINE

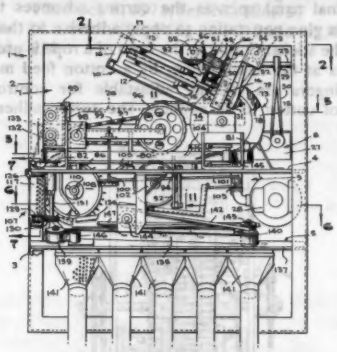
John M. Jones, Jr., Hertford, N.C., assignor to Mrs. Elvira Cheatham Jones, Henderson, N.C.

Filed March 3, 1971, Ser. No. 120,455

Int. Cl. A22c *29/00*

U.S. Cl. 17—71 **25 Claims**

A shrimp processing machine including shrimp feeding, deheading, deveining and shell-slitting, shell-removing, and shrimp grading stations arranged along a path on several superposed levels with means to transport and properly orient shrimp from one level to another. A feed conveyor is used having troughs with a movable wall to clamp shrimp firmly during deheading, and brushes are used to eject deheaded shrimp from the conveyor. After shell-slitting and deveining, the shrimp are transferred from one level to another while being pressed into a converging throat between oppositely



rotating rollers which grip and remove the shell from the meat. The processed meat is then carried along the grading station where it is removed according to size.

3,698,039

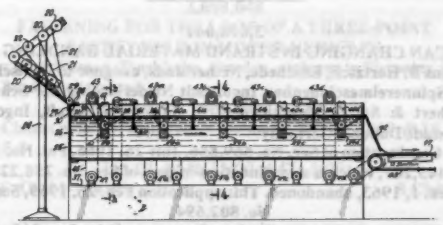
APPARATUS FOR SPREADING TOWS OF CONTINUOUS FILAMENTS INTO SHEETS

Frank Kalwaites, Somerville, N.J., assignor to Johnson & Johnson

Division of Ser. No. 472,504, July 16, 1965, Pat. No. 3,376,609. This application Oct. 23, 1967, Ser. No. 677,214. The portion of the term of this patent subsequent to April 9, 1982, has been disclaimed.

Int. Cl. D02g *1/00*

U.S. Cl. 19—66 T **2 Claims**



Apparatus for spreading a plurality of tows of continuous filaments into sheet form comprising a container for a liquid in which there are placed a series of pairs of nip rolls submerged in a liquid. Between each successive pair of nip rolls there are positioned in the liquid means for applying both longitudinal and transverse forces to the plurality of tows as they pass through the successive pairs of nip rolls. There is feed means at one end of the container and means for removing the tow in sheet form at the other end of the container. The removing means is preferably an inclined plane over which liquid from the container is flowing to apply diverging forces to the plurality of tows to further open them into sheet form.

3,698,040

APPARATUS FOR FABRICATION OF SWABS

George M. Mourkakos, 39-23 57th Street, New York, N.Y.

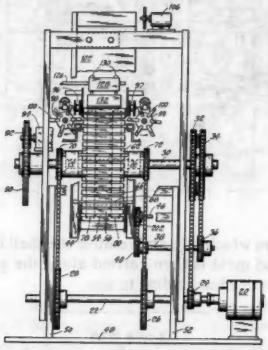
Filed April 26, 1971, Ser. No. 137,367

Int. Cl. D01g *13/00*

U.S. Cl. 19—145.3 **9 Claims**

A machine for the fabrication of cotton swabs embodying a rotating carrier or conveyor drum provided with circumferential cross slots which individually receive sticks from a vibrated hopper. The feed mechanism at the terminus of the hopper feed is formed to coact with a complementary member

to assure the insertion of only one stick into each peripheral slot and to temporarily restrain the succeeding stick. The sticks are engaged by a rotating friction wheel which imparts longitudinal axial spin as the carrier advances the sticks through a glue pot station to apply adhesive to the opposite ends of the sticks. Cotton in the form of a rope is presented to the sticks at the next station, by a cotton feed mechanism whose fingers are radially adjustable for controlling the amount of cotton to be applied. The cotton adheres to the



stick and is wound thereon by the spin thereof and is severed by the coaction of a plurality of rotating blades against the forward edge of a spring loaded block as the stick ends enter the first compressive die. Here, as in the successive dies, the cotton is compressed and more tightly wound thereon as the stick continues to be spun. An escapement wheel thereafter diverts the sticks from the carrier to a slotted transfer carrier belt and then to an automatic packaging unit where the sticks are counted and layered into a box tray with interlayer separators.

3,698,041

CAN CHANGING IN STRAND MATERIAL HANDLING

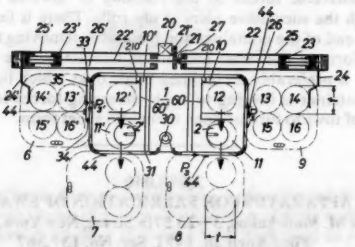
Hans B. Hertzsch, Enschede, Netherlands, assignor to Deutsche Spinnereimaschinenbau Ingolstadt Niederlassung der Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt/Danube, Germany

Continuation of Ser. No. 569,556, July 26, 1966, Pat. No. 3,443,287, which is a continuation-in-part of Ser. No. 256,220, Feb. 1, 1963, abandoned. This application Feb. 26, 1969, Ser. No. 802,694

Claims priority, application Germany, Feb. 9, 1962, D 38105; Feb. 12, 1963, D 40673. The portion of the term of this patent subsequent to May 13, 1986, has been disclaimed.

Int. Cl. B65h *54/80*

U.S. Cl. 19—159 A **9 Claims**



The automating of can changing in the production of roving. Provision is made for automatically supplying sliver cans to a filling station and for removing filled cans from the filling station.

3,698,042

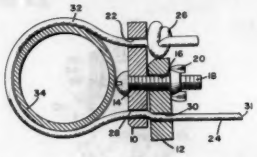
ROPE CLAMPS

Sidney H. Hirschhorn, 8-20 Fairlawn Avenue, Fairlawn, N.J.

Filed Jan. 25, 1971, Ser. No. 109,355

Int. Cl. B65d *63/00*; F16g *11/00*

U.S. Cl. 24—19 **3 Claims**



Two plates having means extending through aligned holes so as to draw the plates towards one another to clamp an intermediate portion of a rope extending through a hole in each of the plates, the latter holes offset from one another, and one of the plates being adapted to be engaged by an end portion of the rope so as to form a loop in the rope intermediate the end portion and the clamped portion.

3,698,043

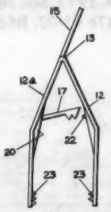
MOLDED GARMENT CLAMP

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed March 10, 1970, Ser. No. 18,108

Int. Cl. A44b *21/00*

U.S. Cl. 24—84 H **25 Claims**



A device for gripping and hanging articles. The device includes, as a single integral part molded from a plastic material, a pair of clamping members, a flexible web joining these members and serving as a hinge, a latch to lock the members in closed position and a hook by which the device can be suspended. The arrangement of the various features of the device is such that the device can be molded in a two-part die without the use of cams or similar devices to permit release of the molded part from the die.

3,698,044

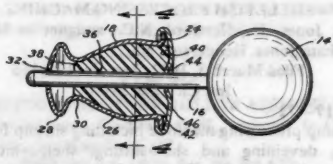
CLUTCH MECHANISM FOR JEWELRY PIN

Michael Chernow, New York, N.Y., assignor to Monocraft, Inc.

Filed July 19, 1971, Ser. No. 163,690

Int. Cl. A44c *7/00*

U.S. Cl. 24—108 **6 Claims**



A clutch mechanism for securing a jewelry piece, such as a pierced earring, to a support member. The jewelry piece includes an elongated pin, and the clutch mechanism is slidably

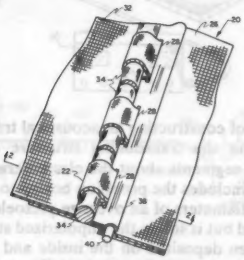
mounted on the pin in such a manner that it can readily be separated from the pin. The clutch mechanism includes a gripper portion for facilitating easy handling of the clutch, and it includes a flexible insert for frictionally gripping the pin.

3,698,045

FABRIC CONNECTOR

Robert J. Redden, Newark, Del., assignor to ILC Industries, Inc.

Filed Dec. 6, 1968, Ser. No. 781,834
Int. Cl. A44b *19/00*
U.S. Cl. 24—203 29 Claims



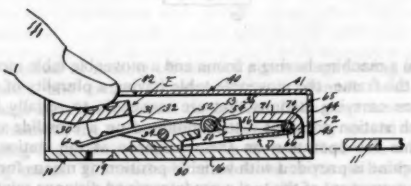
A connector for releasably joining opposite edges of sheets of flexible material such as adjacent fabric sections of an inflatable structure wherein one of the sheets is provided with spaced loop members while another sheet is provided with mating spaced apertures inwardly positioned from the edge of the sheet and adapted to receive the loops therethrough. The loop members, after passage through the apertures, are held in locked position by rod-like means that pass through the loops locking the sheets tightly together. Also, more loops can be provided than mating apertures so that there are free loops after connection has been made between two sheets of flexible material for attaching a third sheet of material to the free loops in a manner as described above.

3,698,046

SPRING LATCHING SAFETY BELT PUSH TYPE

William J. Eubank, Livonia, Mich., assignor to Irvin Industries Inc., Greenwich, Conn.

Continuation of Ser. No. 762,943, Sept. 26, 1968, abandoned.
This application Aug. 27, 1970, Ser. No. 67,599
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 A 6 Claims



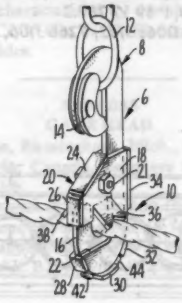
A safety belt buckle construction in which a latching dog and biasing spring are integrally connected in such relation within a casing as to enable an operating means to simultaneously flex the spring and move the the dog into operative latching position. The rigidly and integrally connected biasing means and latching dog provide a mechanical device capable of withstanding large belt forces. The movable mounting construction of the latch is such as to provide added strength to the latching dog.

3,698,047

CABLE CLAW ATTACHMENT

George W. Pierce, 340 West 29th Avenue, Eugene, Oreg.

Filed Oct. 5, 1971, Ser. No. 186,727
Int. Cl. A44b *13/00*; F16g *11/00*; B64d *17/38*
U.S. Cl. 24—238 2 Claims



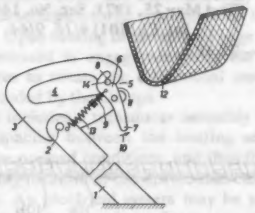
A cable claw attachment for tying down small aircraft is provided which is easily moved along the cable to a desired position by hand but wherein any upward or sideways movement of the aircraft will engage the claw and prevent movement along the cable. Tools are required to fasten the claw so that pilferage losses are reduced. An adapter provides for clamping on various sizes of cables.

3,698,048

FASTENING FOR THE LOOP OF A THREE-POINT SAFETY BELT IN MOTOR VEHICLES

Per Olaf Weman, Stockholm, Sweden, assignor to Sigmatex Ag, Basel, Switzerland

Filed Nov. 26, 1969, Ser. No. 880,196
Claims priority, application Germany, Dec. 2, 1968, P 18 12 115.8
Int. Cl. A44b *13/00*; A47c *3/00*
U.S. Cl. 24—241 P 8 Claims



A fastening for holding the loop of a three-point safety belt in motor vehicles comprises a rigid bracket secured to the vehicle floor and carrying a clasp formed with an arm of which the underside defines a slot extending lengthwise of the vehicle for the insertion thereinto of the loop, the open end of said slot which faces the back of the vehicle being closed by a catch which is openable by the belt itself when this is pushed into the slot from the back.

3,698,049

APPARATUS FOR THE CONTINUOUS GASEOUS TREATMENT OF TEXTILE MATERIALS

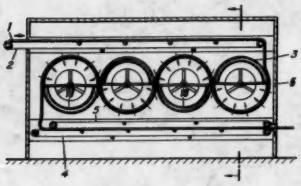
Heinz Fleissner, Egelsbach near Frankfurt Main, Germany, assignor to Vepa AG, Basel/Schweiz, Germany

Division of Ser. No. 831,686, July 9, 1968, Pat. No. 3,521,378, which is a continuation-in-part of Ser. No. 654,728, July 20, 1967, Pat. No. 3,503,134. This application Nov. 21, 1969, Ser. No. 877,564

Claims priority, application Germany, June 8, 1968, P 17 60 604.1; June 22, 1968, P 17 60 717.9; June 27, 1968, P 17 60 751.1; April 8, 1969, P 19 17 757.2

Int. Cl. D06c *3/02*; F26b *3/06, 13/30*

U.S. Cl. 26—60 4 Claims



The present disclosure is directed to apparatus for the treatment of materials which comprises a heat-insulated housing divided into a circulation chamber and a treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means associated with the sieve drum means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, perforated conveying means cooperating with the sieve drum means for the effective conveyance of the material being treated by free fall to said sieve drum means, and additional perforated conveying means disposed below the sieve drum means for guiding the material to outlet means for discharging the material being treated from the treatment chamber.

3,698,050

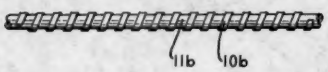
METHOD OF PRODUCING A COMPOSITE ELECTRODE

Leonard R. Rubin, Short Hills, N.J., assignor to Engelhard Minerals & Chemicals Corporation

Filed May 25, 1971, Ser. No. 146,619

Int. Cl. H01j *9/16, 9/44*

U.S. Cl. 29—25.18 7 Claims



A composite material comprising titanium or a titanium alloy substrate to which is bonded a platinum group metal coating is prepared by a method which includes the steps of wrapping a platinum group metal wire around the substrate, which is in the form of a cylinder, and then converting the wire-wrapped cylinder to a unitary body by annealing and swaging steps. The resultant composite material is particularly useful as an electrode material.

3,698,051

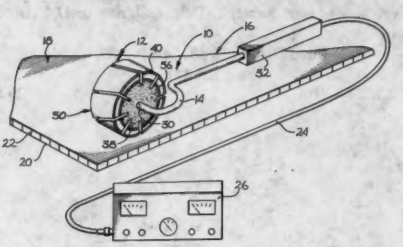
METHOD OF MAKING AN ACOUSTICAL TRANSDUCER

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

Filed Feb. 6, 1970, Ser. No. 9,239

Int. Cl. H04r *17/00*

U.S. Cl. 29—25.35 16 Claims



A method of constructing an acoustical transducer in roller shape wherein the transducing structure is a plurality of piezoelectric segments about the circumference of the roller. The method includes the precision boring to size of the inside and outside diameters of an oversize piezoelectric tube which has been fired but is still in the unpolarized state. An electrical coating is then deposited on the inside and outside diameter and the tube is electrically polarized. The tube is filled with a low exotherm electrically conductive acoustical damping material which is allowed to harden. The tube is then divided into a plurality of parallel sections and cut into several individual roller acoustical transducers, each transducer having a plurality of individual segments.

3,698,052

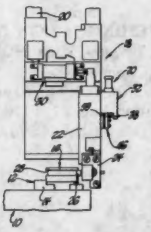
VARIABLE POSITIONING MEANS

Walter S. Ellis, Troy, Mich., assignor to Schulze & Burgess Company, Mount Clemens, Mich.

Filed April 16, 1971, Ser. No. 134,636

Int. Cl. B23p *23/00*

U.S. Cl. 29—38 C 15 Claims



In a machine having a frame and a moveable table mounted on the frame, the moveable table having a plurality of workpiece carrying stations that are moveable to serially locate each station adjacent a tool mounted on a crosslide on the frame for operation on the workpiece at the station. The machine is provided with variable positioning means for limiting movement of the tool a predetermined distance relative to each of the workpieces at the operating station. The variable positioning means includes a reference device mounted on the crosslide and in fixed location relative to the tool, and a movement limiting device for each of the workpiece stations and adapted to be engaged by the reference device at the end of the tool operation. The limiting devices are equal in number to the number of workpiece stations and each may be dimensioned in accordance with the workpiece mounted at the station. Thus, variances in tolerance stackup and movement in the machine itself will be accommodated for each workpiece

station and the workpiece mounted thereon. Means are provided to move the limiting devices into adjacent relation to the reference device as the machine table is moved to place a different station adjacent the crossslide. Further means are provided to prevent retrograde movement of the limiting devices as they are moved from station to station.

3,698,053

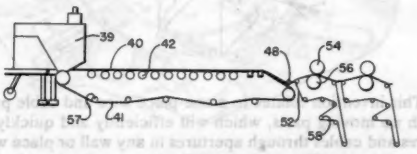
HIGH SPEED ROLL FOR MACHINERY

Ralph A. Hess, Medfield, Mass., and James P. McNamee, Pawtucket, R.I., assignors to SW Industries, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 857,186, Sept. 11, 1969, Pat. No. 3,593,398. This application May 6, 1971, Ser. No. 140,722

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 **5 Claims**



A press roll for paper making machinery has a mandrel, characteristically composed of a two phase system with an external phase containing a synthetic polymeric matrix and an internal phase containing aligned continuous carbon fibers. The construction of this press roll permits unusually high speed operation.

3,698,054

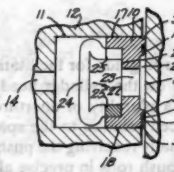
METHOD OF MAKING OIL CONTROL PISTON RINGS

Herbert F. Prasse, Town & Country, Md., assignor to Ramsey Corporation, St. Louis, Mo.

Filed March 10, 1971, Ser. No. 122,798

Int. Cl. B23p *15/06*

U.S. Cl. 29—156.63 **3 Claims**



A method of making oil control piston rings having inner diameter and outer diameter central channels with oil drainage slots spaced apart circumferentially communicating the channels, the outer diameter having axially spaced apart scraping beads with radial grooves therein filled with a hard facing metal. The method includes the sequential steps of making a cast unsplit ring, providing axially spaced-apart radial grooves in the outer diameter of the ring, providing an internal inner diameter channel in the said ring, forming blind oil drainage slots in the inner diameter of the ring, spray-coating stacked rings on the outer diameter with a hard-faced coating, machining the stacked rings on the outer diameter to remove the coating except in the area of the outer diameter grooves, forming an outer diameter channel on the ring thereby opening the blind oil slots and forming bevels on the axial ends of the outer diameter of the ring and thereafter splitting the ring axially.

3,698,055

HEAT RESISTANT ALLOYS OF IRON, COBALT AND/OR NICKEL AND ARTICLES THEREOF

Frederick C. Holtz, Jr., Evanston, Ill., and Hugh Morrow, III, Ann Arbor, Mich., assignors to Crucible, Inc.

Continuation-in-part of Ser. No. 743,921, July 21, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 102,203

Int. Cl. C22c *39/10, 39/36, 39/50*

U.S. Cl. 29—180 **7 Claims**

Alloys of iron, cobalt and/or nickel containing from 0.5 to 4.0% carbon and from 5 to 60% tungsten, molybdenum or mixtures thereof characterized by the absence of "reactive" elements such as Cr, V, Cb, Ta, Ti, Si, Mn and Al. which form hard-to-reduce oxides.

3,698,056

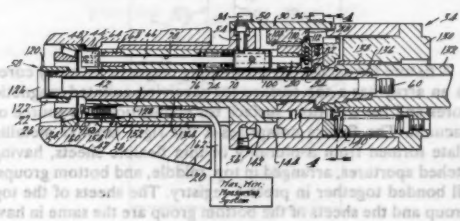
GAGE HEAD

Guy Donald Pierce, Birmingham, Mich., and Rudi K. Runft, Windsor, Ontario, Canada, assignors to The Cross Company, Fraser, Mich.

Continuation-in-part of Ser. No. 669,103, Sept. 20, 1967, abandoned, Continuation of Ser. No. 19,551, March 19, 1970, abandoned. This application May 17, 1971, Ser. No. 143,966

Int. Cl. B23p *19/04*; **B23q** *17/00*

U.S. Cl. 29—201 **28 Claims**



A gage head mechanism for selecting bearing shims during assembly of a differential drive for insertion behind the differential bearings at opposite sides of the differential case so as to assure a proper and acceptable amount of backlash between the ring gear and the drive pinion.

The gage head mechanism is adapted to provide a proper and acceptable backlash between the drive pinion and the ring gear under conditions in which the differential case is supported in the differential carrier with the side bearings loosely resting on and shiftable relative to the side bearing seats. The mechanism includes spaced gage heads including reciprocable clamps which are movable in opposite directions against the side bearings to shift the side bearings and the differential case within the differential carrier and simultaneously preload the bearings to a predetermined force, and thus load the ring gear and drive pinion. Upon seating of the spaced gage heads, a rotary drive is positioned in engagement with the differential drive and operates to rotate the differential case while the bearings are preloaded by the clamps.

The gage head includes a transducer assembly which measures the axial spacing between the bearing seat and the bearings under the preload conditions, and thus the runout of the ring gear during rotation of the differential case by the rotary drive means. An electrical system may be provided for deriving a signal from the transducer for measuring the space between the bearings and their respective seats. This measurement is used to select and cause the placement of suitably sized shims when the case is positioned in the mean runout position, and the illustrated system includes a brake assembly for stopping the rotation of the gage head automatically in the mean runout position.

The purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers, or practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection, the nature and es-

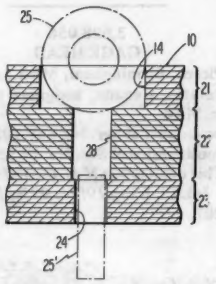
sence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,698,057

REVERSIBLE FIXTURE FOR POSITIONING MAGNETIC MEMORY CORES

Clifford George Warner, Abington, and James Henry Kade, Norwood, both of Mass., assignors to RCA Corporation

Filed June 10, 1971, Ser. No. 151,820
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 MM **2 Claims**



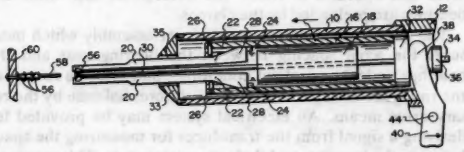
A fixture for accurately positioning magnetic memory cores in an array has a top surface for receiving agitated magnetic cores and has a bottom surface for connection to a source of vacuum. The fixture comprises a flat rigid laminar metallic plate formed from a plurality of thin flexible sheets, having etched apertures, arranged in top, middle, and bottom groups, all bonded together in precise registry. The sheets of the top group and the sheets of the bottom group are the same in having rectangular apertures each dimensioned to receive a core edgewise to a depth of up to one-half of the outer diameter of the core. The sheets of the middle group have smaller apertures. The useful life of the fixture can be doubled by turning it over when the top surface becomes worn by the abrasive cores.

3,698,058

APPARATUS FOR APPLYING WITH CLAMP TERMINAL CLIPS OF THE FLANGED TUBULAR TYPE

William A. Reimer, Wheaton, Ill., and Frederick G. Storz, Englishtown, N.J., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 14, 1971, Ser. No. 143,342
Int. Cl. H01r *43/00*
U.S. Cl. 29—200 HC **10 Claims**



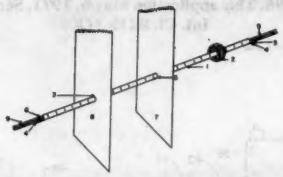
A tool for the installation of flanged tubular type wire clamp terminal clips over a wire lead and post terminal includes a plurality of finger members pivotally mounted about a hollow central push rod such that they close radially toward the rod on the application of axial pressure. Means for applying axial pressure is provided whereby a flanged tubular type wire clamp terminal clip is gripped between the fingers and push rod. As pressure is increased the fingers and rod exert opposing axial forces on the terminal clip sufficient to deform the cylindrical clip wall inwardly thereby securing the wire to the terminal. In an alternative embodiment a solid central push rod is employed to effect removal of the terminal clips.

3,698,059

EZE-WIRE AND CABLE PULLER

Gayle Darwin Richardson, 505 Dallas Avenue, Artesia, N. Mex.

Filed July 8, 1971, Ser. No. 160,838
Int. Cl. H01r *43/00*; B23p *19/04*
U.S. Cl. 29—203 H **1 Claim**



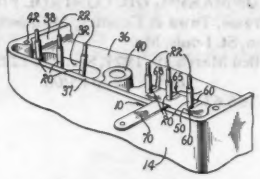
This invention relates to a one-piece wire and cable puller, with no moving parts, which will efficiently and quickly pull wires and cables through apertures in any wall or place where threading or pulling might be difficult.

3,698,060

REMOVABLE PUSH ROD GUIDE FOR ENGINE ASSEMBLY

Clyde E. Helton, 22238 Avenue 152, Portervile, Calif.

Filed Jan. 28, 1971, Ser. No. 110,406
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 P **10 Claims**



A removable push rod guide for facilitating the assembly of the rocker arm head on the cylinder head of an engine with the guide providing a plurality of apertures therethrough in correspondingly spaced relation to the spacing of the rocker arm seats for individually receiving the push rods in order temporarily to hold the push rods in precise alignment with their respective rocker arms during such assembly of the rocker arm head onto the cylinder head of the engine. The push rod guide is adapted readily to be removed without disturbing the seated push rods prior to complete assembly of the heads.

3,698,061

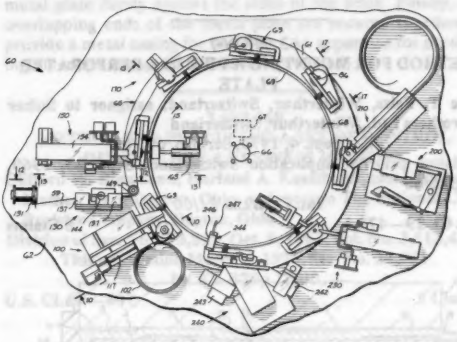
APPARATUS FOR FORMING AND TESTING ELECTRICAL COMPONENTS

Thomas Alvin La Valle, Annapolis, Md., assignor to Western Electric Company Incorporated, New York, N.Y.

Division of Ser. No. 878,017, Nov. 19, 1969, Pat. No. 3,618,204. This application Aug. 13, 1971, Ser. No. 171,433
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 D **2 Claims**

A turntable having workholders spaced about the periphery thereof is indexed to advance each of the workholders successively through work stations positioned adjacent the periphery of the turntable to assemble electrical components. A first part positioned in one of the workholders has the leading end

of an insulated wir extending from a supply of wire welded thereto. The firs part is indexed without severing the wire extending from the first part to the supply, and a combined swaging and testing apparatus swages an upper rim of the first part. A portion of the wire extending to the first part in the workholder is separated from the supply while testing the weld of the wire to the first part and the new leading end of the wire is



attached to the first part in the next succeeding workholder. Subsequently, the portion of the wire is wound on the first part, a second part is assembled to the first part and, the trailing portion of the wire is welded to a metal cap which is secured to the second part, and the strength of the weld is tested, whereafter the electrical component is tested electrically and then sorted.

3,698,062

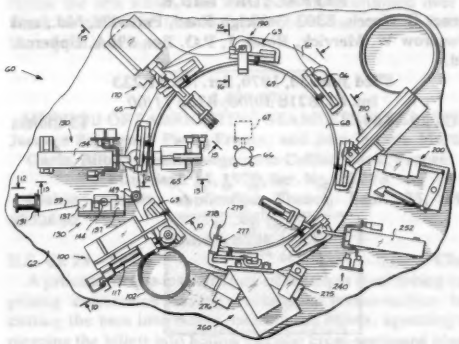
APPARATUS FOR WINDING ELONGATED MATERIAL ON AN ELECTRICAL COMPONENT

Thomas Alvin La Valle, Annapolis, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 878,017, Nov. 19, 1969, Pat. No. 3,618,204. This application Aug. 13, 1971, Ser. No. 171,505

Int. Cl. H01r *43/00*; B23p *19/04*

U.S. Cl. 29—203 D **4 Claims**



A rotatable turntable having a plurality of workholders spaced about the periphery thereof is indexed to advance each of the workholders successively through each of a plurality of work stations positioned adjacent the periphery of the turntable to assemble electrical components. A first part positioned in one of the workholders has the leading end of an insulated wire extending from a supply of wire welded thereto, after which the first part is indexed to another without severing the wire extending from the first part to the supply. A portion of the wire extending to the first part in the workholder is severed from the supply and the new leading end of the wire is attached to the first part in the next succeeding workholder. The first part is rotated in the first workholder while tensioning the wire extending from and secured to the first part to wind the wire thereon as the workholder is advanced with the turntable. Facilities are provided for orienting the workholders prior to the winding of the wire on the first parts. Subsequently, a second part is assembled to the first part and, simultaneously, the insulation on a portion of the wire extending from the first part is stripped, whereafter the trailing portion of the wire is welded to a metal cap which is secured to the second part, the strength of the weld is tested, and the electrical component is advanced to a last work station, tested electrically, and then sorted.

3,698,063

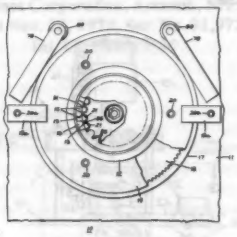
APPARATUS FOR INSERTING COIL SIDE TURN PORTIONS AND INSULATORS INTO THE SLOTS OF A MAGNETIC CORE

Dallas F. Smith, Fort Wayne, Ind., assignor to General Electric Company

Filed March 19, 1971, Ser. No. 126,078

Int. Cl. H02k *15/00*

U.S. Cl. 29—205 R **12 Claims**



Apparatus for inserting coil side turn portions, and insulators when desired, into axially extending slots of a magnetic core having a given stack height within a predetermined range of stack heights. The apparatus has a turn inserting device including coil turn feeder blades and a support for mounting the coil turn feeder blades and a core for relative axial movement. A drive effects an increment of relative movement of the turn feeder blades and core for inserting the coil side turn portions. A control is adjustable through the turn inserting device at a location remote from the drive for setting the selected increment of travel to conform to the given core stack height. The apparatus also has divider blades forming turn-receiving gaps and movable relative to the core during a selected portion of the selected increment of movement of the coil turn feeder blades. There is another control, adjustable concurrently with the control that is adjustable through the turn inserting device, for setting the selected portion of the selected increment of movement to conform to the given core stack height.

3,698,064

METHOD FOR DRAWING SLIDING CLASPS AND FIXING STOP MEMBERS ONTO ENGAGED SLIDING-CLASP FASTENER TAPES

Wilhelm Uhrig, Wuppertal-Elberfeld, Germany, assignor to Supin Etablissement, Vaduz, Liechtenstein, Germany

Filed June 29, 1971, Ser. No. 157,821

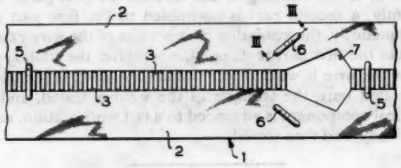
Claims priority, application Germany, July 24, 1970, P 20 36 709.3

Int. Cl. B23p *11/00*; B21d *53/50*

U.S. Cl. 29—408 **4 Claims**

A method for applying small prefabricated stop members and drawing sliding clasps onto sliding-clasp fastener tapes comprising attaching two upper stop members and one lower stop member at top and bottom ends of an engaged fastener

tape, the lower member fitting over the engaged teeth of the top and providing a lower stop for the travel of the clasp, while the upper stop members are fitted in outwardly splayed



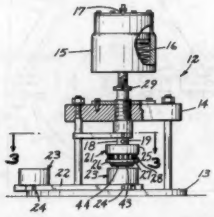
fashion with the divergent ends in the direction of the tape advance so that the moving clasp can back over these members in traveling toward the lower stop member.

3,698,065

APPARATUS FOR MAKING A DISPLAY BUTTON

Judson Olbert Sorenson, Winona, Minn., assignor to Asco, Inc., Winona, Minn.

Filed Aug. 24, 1970, Ser. No. 66,210
Int. Cl. B23p *19/04*
U.S. Cl. 29—238 **10 Claims**



Apparatus for the manufacture of a laminated button comprising a metallic backing plate having a transverse peripheral edge and an outwardly extending flange, an illustrated paper sheet and a protective acetate covering. The apparatus comprises a pneumatically operated press which receives the plate, illustrated sheet and covering, and, with a single downward movement, causes the sheet to conform to the plate and be crimped between the transverse edge and flange.

3,698,066

METHOD OF PRODUCING TUNNEL OR LIKE STRUCTURE

Charles E. Cornwell, Alexandria, Va., assignor to Jennings Bailey, Jr., Frederick, Md.

Filed Dec. 21, 1970, Ser. No. 100,197
Int. Cl. E04b *1/04, 1/16*
U.S. Cl. 29—458 **1 Claim**

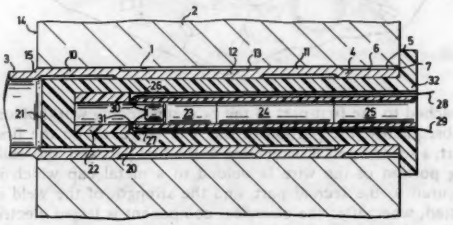
A tunnel section is produced by enclosing an annular ring of expanded metal within an outer covering of plastic material. The expanded metal has inward projections struck out from it which are small enough to enter the spaces or to enter into openings provided in another sheet. The inner surface of the expanded metal is then sprayed with concrete, the thickness of the layer formed being less than the length of the struck out tongues. After the concrete is sufficiently cured, another layer of expanded metal is placed on the inside wall, with the tongues of the first layer passing through openings in it, and the tongues are bent over to secure the latter layer in position and to connect the layers together. The second layer also has inwardly projected tongues. The second layer is then sprayed in the same manner as the first. This is continued until the desired wall thickness is obtained.

3,698,067

METHOD FOR MOUNTING A PIPE IN A PERFORATED PLATE

Rene T. Feiss, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sept. 4, 1970, Ser. No. 69,703
Claims priority, application Switzerland, Sept. 23, 1969, 014326/69
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **8 Claims**



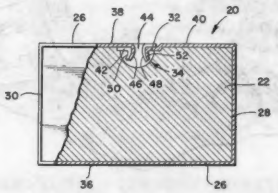
The pipe is fitted with at least a pair of explosive members, one of which serves to weld the pipe to the perforated plate while the other serves to expand the pipe into bearing contact with the plate. The detonation of the two members takes place in the same operation. A third explosive member can also be fitted in the pipe for welding the pipe to an opposite side of the plate.

3,698,068

METHOD OF APPLYING A METAL PLATE TO A REFRACTORY BRICK

Clarence G. Norris, 8303 Oakleigh Road, Parkville, Md., and Woodrow W. Merrick, Route 1, P.O. Box 496A, Upperco, Md.

Filed June 30, 1970, Ser. No. 51,223
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—509 **13 Claims**



A furnace block comprising a refractory brick having a metal casing is provided. In the construction of the furnace block, overlapping ends of the metal plate are secured together at an elongated groove formed along one surface of the brick to provide a metal casing for the brick. One end of the metal plate has an offset which is received in the elongated groove. The overlapping ends of the metal plate are connected by puncturing or welding to lock the overlapping ends together and to secure the metal plate to the brick. A method of applying a metal plate to a refractory brick is also provided. In this method, the brick is positioned on one surface of the

metal plate at a position intermediate between the ends of the metal plate, and the ends of the plate are bent into contact with the sides of the brick by using the brick as a male die. During the bending, the metal plate is held firmly against the bottom surface of the brick. Then the portions of the metal plate which extend above the top surface of the brick are bent into contact with the top surface to overlap the ends of the metal plate while holding the previously bent portions of the metal plate firmly against the sides of the brick. Finally, the overlapping ends of the metal plate are secured together to provide a metal casing for the brick. An apparatus for producing the metal encased bricks is also provided.

3,698,069

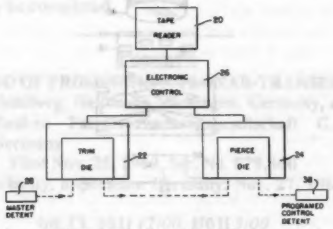
METHOD FOR PRODUCING A SET OF CONTROL DETENTS FOR A BUSINESS MACHINE

Clifford W. Bossmann; Harland A. Kaufmann, and Charles E. Mathes, all of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 673,829, Oct. 9, 1967, Pat. No. 3,512,435. This application March 6, 1970, Ser. No. 24,951

Int. Cl. B23p *17/00*

U.S. Cl. 29—407 **5 Claims**



A method and apparatus for producing a set of control detents for a business machine like a cash register. The method includes trimming off the unwanted external control surfaces on a control detent blank and then forming the internal control surfaces desired on said blank as controlled by a punched tape. A special die construction having five shiftable die units is used in the forming operation. Each die unit has nine different die sets which can be selectively positioned over the blank to effect the forming operation in response to instructions from said tape.

3,698,070

METHOD OF FABRICATING SEAMLESS STEEL PIPES

Jacques Sejournet, Paris, France, and Jose Ignacio Martinez Garin, Bilbao, Spain, assignors to Ceflac, Paris, France

Filed Sept. 24, 1970, Ser. No. 75,273

Claims priority, application France, Sept. 25, 1971, 6932680

Int. Cl. B23k *19/00*

U.S. Cl. 29—527.6 **7 Claims**

A process for the manufacture of seamless steel tubing comprising continuous casting rectangular cross-section bars, cutting the bars into billets, heating the billets, upsetting and piercing the billets into hollow circular cross-sectioned blanks, hot extruding the blanks into seamless tubes and stretch reducing the seamless tubes where necessary.

3,698,071

METHOD AND DEVICE EMPLOYING HIGH RESISTIVITY ALUMINUM OXIDE FILM

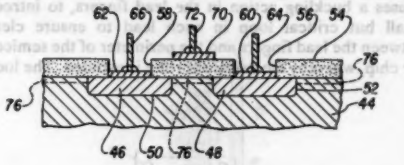
Lou H. Hall, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1968, Ser. No. 706,256

Int. Cl. B01j *17/34*; B44d *1/18*

U.S. Cl. 29—571 **4 Claims**

This invention record discloses an improvement in a method for forming aluminum oxide films characterized by being formed from trimethyl aluminum and nitrous oxide at a reaction temperature of 600°–900°C. The films are deposited over components formed in a semiconductor material. By this



means a special high resistivity insulating film is formed and a shallow region of P-type conductivity is induced at the surface of the semiconductor material. Also disclosed are electronic devices employing the high resistivity aluminum oxide film.

3,698,072

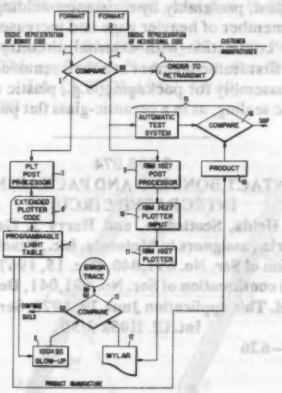
VALIDATION TECHNIQUE FOR INTEGRATED CIRCUIT MANUFACTURE

Jeffrey G. Koens, Wappingers Falls, and Robert D. Merillat, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,972

Int. Cl. H01 *19/00*

U.S. Cl. 29—574 **11 Claims**



A method of making an integrated circuit involves first placing the digital information characterizing the circuit into two separate and different formats. The latter are then transmitted to the manufacturing plant where they are compared. The two formats are then used to form respective artworks depicting a mask for making the integrated circuit. The artworks are then compared. The integrated circuit is then built from the information of one of said formats and is compared with the information in the other format.

3,698,073

CONTACT BONDING AND PACKAGING OF INTEGRATED CIRCUITS

Robert W. Helda, Hollywood, Fla., assignor to Motorola, Inc., Franklin Park, Ill.

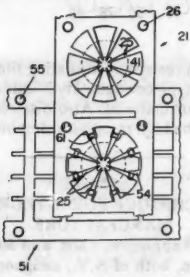
Continuation of Ser. No. 691,041, Dec. 15, 1967, abandoned, which is a continuation of Ser. No. 691,040, Dec. 15, 1967, abandoned. This application Oct. 13, 1970, Ser. No. 80,378

Int. Cl. B01j *17/00*; H01l *1/16*

U.S. Cl. 29—577 **20 Claims**

Wire bonding is eliminated in the assembly of microelectronic devices, by a process involving the direct bonding of

circuit electrodes to a metallic sheet-frame member having a plurality of inwardly extending leads. A single-step bonding technique is employed for the simultaneous bonding of all leads to a semiconductor integrated circuit chip. Lateral confinement of the lead frame member during the bonding steps causes a buckling action in the lead fingers, to introduce a small but critical loop in each lead to ensure clearance between the lead fingers and the perimeter of the semiconductor chip, whereby electrical shorting is avoided. The loop also



provides a structural flexibility in the leads, which tends to protect the bonding sites from excessive stresses. Subsequently, the first frame member including the bonded circuit is attached, preferably by resistance welding, to a second lead frame member of heavier gage and increased dimensions, suitable for connection with external circuitry. Excess portions of the first frame member are then removed, providing a completed assembly for packaging; e.g., plastic encapsulation or heremetic sealing, as in a ceramic-glass flat package.

3,698,074

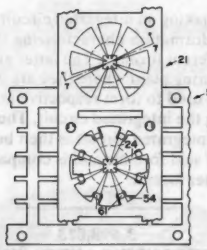
CONTACT BONDING AND PACKAGING OF INTEGRATED CIRCUITS

Robert W. Helda, Scottsdale, and Harry J. Geyer, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 691,040, Dec. 15, 1967, abandoned, which is a continuation of Ser. No. 691,041, Dec. 15, 1967, abandoned. This application June 29, 1970, Ser. No. 56,081

Int. Cl. H05k *3/30*

U.S. Cl. 29—626 **5 Claims**



Wire bonding is eliminated in the assembly of microelectronic devices, by a process involving the direct bonding of circuit electrodes to an unsupported metallic sheet-frame member having a plurality of inwardly extending leads. A single-step vibratory pressure welding technique is employed for the simultaneous bonding of all leads to a semiconductor integrated circuit chip. Lateral confinement of the leads during the bonding steps causes a buckling action to introduce a small but critical loop in each lead to ensure clearance between the lead fingers and the perimeter of the semiconductor chip, whereby electrical shorting is avoided. The loop also provides a structural flexibility in the leads, which tends to protect the bonding sites from excessive stresses. Subsequently, the first frame member including the bonded circuit is attached, preferably by resistance welding, to a second lead frame member of heavier gage and increased dimensions, suitable for connection with external circuitry. Excess portions of the first frame member are then removed, providing a completed assembly for packaging; e.g., plastic encapsulation or hermetic sealing, as in a ceramic-glass flat package.

3,698,075

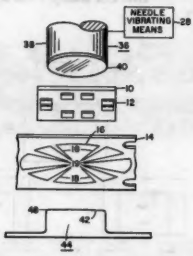
ULTRASONIC METALLIC SHEET-FRAME BONDING

Donald Francis Boyle, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 5, 1969, Ser. No. 874,343

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 **7 Claims**



In simultaneously bonding all the bonding pads of an integrated circuit chip to respective inwardly extending leads comprising parts of an unsupported metallic sheet-frame, a chip bearing the integrated circuit is positioned with its pads in contact with the ends or tips of the leads, comprising part of the frame, on a bonding post. The contacting flat tip of a bonding needle is pressed against the back of the chip to squeeze the ends of the leads and the pads together and the bonding needle is vibrated to cause rubbing motion between the tips of the leads and the bonding pads thereby to bond the ends of the leads to their respective pads. To make sure that the vibrating force is applied to the chip, the flat tip of the steel needle has a layer of soft metal such as copper deposited thereon. To make sure that the ends of the leads do not move and yet to prevent cutting through the leads, the top of the post is not serrated but is roughened as by vapor honing. The tips of the leads are thinned by the squeezing action. The honing also puts a slight curvature on the edges of the posts that are in contact with the leads, whereby a curvature is imparted to the leads at the junction of the thinned and unthinned portions thereof, whereby the leads are weakened at this junction to a lesser extent than in the prior art. The working tip of the post is made hollow to concentrate the compressive force to the area where the leads are in contact with the bonding pads, thereby requiring less pressure on the needle.

3,698,076

METHOD OF APPLYING LEADS TO AN INTEGRATED CIRCUIT

John T. Kingsley, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

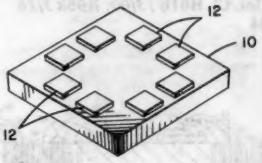
Filed Aug. 3, 1970, Ser. No. 60,340

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 **5 Claims**

In the process of applying leads to the bonding pads of an integrated circuit chip, after the lead portions of the first frame member are bonded to respective bonding pads on an integrated circuit, the first frame member is so contacted with

the sticky side of an adhesive tape as to stick the first frame member and its leads to the tape. Then the part of the first frame member which is not to be used is cut away from the lead portions of the first frame member while the first frame member and its leads are still stuck to the tape. If desired, the resultant product, without further steps, may be put on a reel for sale or storage or for transportation to another work position, or respective leads of a second lead frame member may be bonded to the respective leads of the first frame member and the resultant product which includes the leads of the first frame member and the complete second frame member may be peeled from the tape and transported to storage or to another work position where the packaging of the integrated circuit may be completed.



3,698,077

METHOD OF PRODUCING A PLANAR-TRANSISTOR

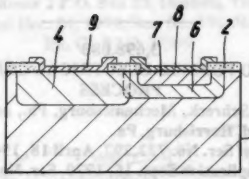
Reinhard Dahlberg, Heilbronn-Bockingen, Germany, assignor to Telefunken Patentverwertungsgesellschaft G.m.b.H., Donau, Germany

Filed Nov. 25, 1969, Ser. No. 879,860

Claims priority, application Germany, Nov. 27, 1968, P 18 11 136.9

Int. Cl. B01j *17/00*; H01l *5/00*

U.S. Cl. 29—578 **16 Claims**



A method of producing a planar transistor by forming a window in a passivating layer on a semiconductor body, diffusing into the semiconductor body through this window an emitter region and a base region in either order, forming a second window adjacent the first window and diffusing a base contact region there through to a depth such as to make contact with the base region. Electrodes are then provided in the first window for the emitter region and in the second window for the base region. Either window may be formed first depending on the diffusing arrangements.

3,698,078

DIODE ARRAY STORAGE SYSTEM HAVING A SELF-REGISTERED TARGET AND METHOD OF FORMING

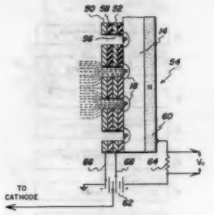
Rowland W. Redington, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 22, 1969, Ser. No. 886,951

Int. Cl. B01j *17/00*; H01l *5/00*

U.S. Cl. 29—578 **3 Claims**

A self-registered diode array camera tube target is formed utilizing a refractory metal grid as a mask both during etching of the insulating layer protecting the semiconductive substrate from electron beam irradiation and during diffusion of the monolithic diode array into the substrate. The refractory metal grid thus completely overlies the insulating layer between adjacent diodes of the target and, upon the application of a suitable electrical bias to the grid, the landing characteristics of the electron beam upon the target is controlled to inhibit charging of the insulating layer by the scanning beam. A dual grid camera tube target also is disclosed wherein the outermost grid controls the electron beam landing profile while a more positively biased inner grid remote from the electron beam negates the generation of conductivity producing charge carriers at the substrate-insulating layer interface.



3,698,079

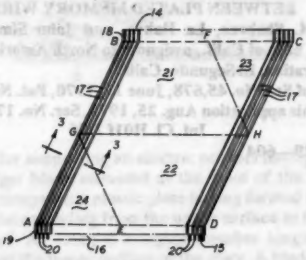
METHOD OF MAKING A PRINTED CIRCUIT ARMATURE

Joshua Lifschitz, Stamford, Conn., assignor to Sperry Rand Corporation

Division of Ser. No. 844,884, July 25, 1969, Pat. No. 3,609,431. This application Nov. 5, 1970, Ser. No. 87,297

Int. Cl. H02k *15/02*, *15/10*

U.S. Cl. 29—598 **3 Claims**



A printed circuit armature wherein the conductors are printed on one face of an insulated support member, and which member is adapted to be folded into opposing leaf portions and then rolled into a cylinder whereby the conductors are arranged on the inner and outer surfaces of the cylinder.

3,698,080

PROCESS FOR FORMING LOW IMPEDANCE OHMIC ATTACHMENTS

Warren E. Berner, Camillus, N.Y., assignor to General Electric Company

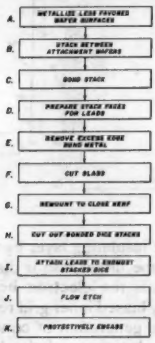
Continuation of Ser. No. 863,210, Oct. 2, 1969. This application Nov. 2, 1970, Ser. No. 85,960

Int. Cl. B01j *17/00*

U.S. Cl. 29—583 **4 Claims**

A plurality of semiconductor wafers each containing a junction are plated with aluminum on an N conductivity type surface and stacked between P conductivity type attachment wafers. The stack is heated to bond the wafers, gold is plated onto the endmost wafers, and excess aluminum at the

periphery of the stack is removed. The wafer stack is subdivided first into slabs and then the slabs repositioned to close the kerf formed by sawing. The repositioned slabs are then subdivided into unitary dice stacks. The unitary dice stacks are then attached to gold coated leads and freed of surface



contaminants by flow etching. The cleaned unitary dice stacks are separately protectively encapsulated to form completed rectifiers by first depositing a passivant over the semiconductive surfaces and then molding a plastic housing around the elements.

3,698,081

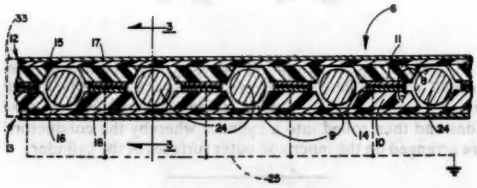
METHOD OF PROVIDING INTERSTITIAL CONDUCTORS BETWEEN PLATED MEMORY WIRES

Joseph M. Shaheen, La Habra, and John Simone, Garden Grove, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Division of Ser. No. 45,678, June 12, 1970, Pat. No. 3,662,358. This application Aug. 25, 1971, Ser. No. 174,749

Int. Cl. H01f *7/06*

U.S. Cl. 29—604 **6 Claims**



Single copper layers on two double copper clad dielectric boards are etched into strips. The strips are used as masks for permitting channels to be etched in the exposed surfaces of the dielectric substrates. After the channels have been etched, the copper strips are re-etched into a preferred interstitial conductor width. The two boards are joined together with the copper strips and channels in registration for forming tunnels for accommodating plated memory wires. The copper strips comprising the interstitial conductors between the tunnels are connected together at a common point.

3,698,082

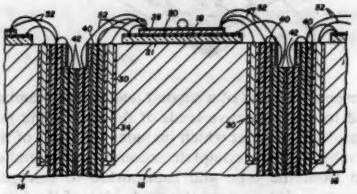
COMPLEX CIRCUIT ARRAY METHOD

Tom M. Hyltin; Jack S. Kilby, both of Dallas; Gerald Luecke, and Harold D. Toombs, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 736,924, May 21, 1969, abandoned, which is a division of Ser. No. 545,077, April 25, 1966, Pat. No. 3,436,609. This application Feb. 25, 1971, Ser. No. 119,046

Int. Cl. H01b *13/00;* **H05k** *3/28*

U.S. Cl. 29—624 **6 Claims**



A method for fabricating an integrated circuit array supporting substrate having coaxial transmission lines formed about a core means in proper position for electrically connecting integrated circuit chips. After determining the position and function of the integrated chips mounted upon the core means, the substrate is fabricated by properly positioning insulated conductors in a frame designed to retain the conductors in a desired arrangement, folding the frame about the core, plating the insulated conductors, core and frame with metallized layers to form coaxial cables of the insulated conductors, encapsulating the device, and exposing the ends of the coaxial lines.

3,698,083

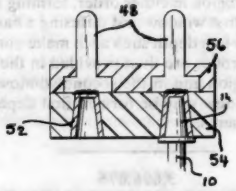
ELECTRO FORMED ELECTRICAL CONNECTOR PROCESS

John Thomas Schreck, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 722,297, April 18, 1968, abandoned. This application Sept. 15, 1970, Ser. No. 72,507

Int. Cl. H02g *15/00*

U.S. Cl. 29—629 **7 Claims**



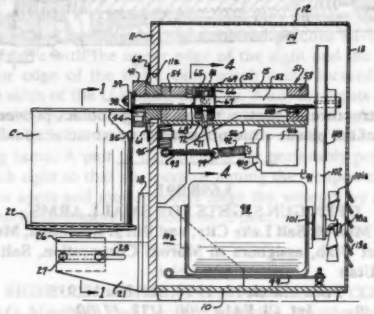
Method and means are disclosed wherein electrical connector elements are formed by electro-plating conductive material onto a passive metal mandrel with an insulating material then being molded about the plating with the mandrel being withdrawn. Selective plating of precious metal only where needed, as within a receptacle, is achieved directly in forming the element.

3,698,084

POWER OPERATED CAN OPENER

Ralph M. Peterson, Rockford, Ill., assignor to Peterson-Kruse, Inc., Rockford, Ill.

Filed Jan. 18, 1971, Ser. No. 107,142
Int. Cl. B67b 7/38
U.S. Cl. 30—4 R **14 Claims**



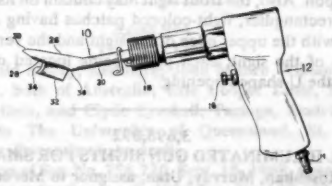
An apparatus for opening cans of the type having an axially projecting end seam. The can opener has a cutter and a drive wheel mounted on a vertically movable head to enable lowering and raising of the cutter and drive wheel into and out of position at relatively opposite sides of the can end seam, and the rotary drive wheel is mounted for movement relative to the cutter head in a direction laterally of the cutter into and out of an operative position firmly pressing the end seam of the can against the cutter. A common actuator means is provided for raising and lowering the cutter head and for moving the drive wheel toward and away from the cutter.

3,698,085

SLEEVE SLITTER

Jimmy C. Ray, Route 2 P.O. Box 33, Denison, Tex.

Filed Dec. 24, 1970, Ser. No. 101,366
Int. Cl. B26b 27/00
U.S. Cl. 30—90.4 **2 Claims**



A chisel has a bent forward portion with a guide surface and a chisel blade projecting at right angles from the guide surface. The tool is for the purpose of slitting sleeves of telephone cables and is operated from a pneumatic hammer.

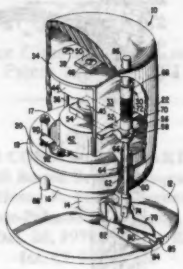
3,698,086

ELECTRIC SCISSORS

John A. Herr, Gardwood, N.J., assignor to The Singer Company, New York, N.Y.

Filed July 1, 1970, Ser. No. 51,467
Int. Cl. B26b 15/00
U.S. Cl. 30—228 **8 Claims**

An electric scissors unit having a vibratory motor for oscillating a pivotal blade to effect a cutting engagement along a small portion thereof with a ledger blade. A drive rod connected to the pivotal blade is oscillated by a pivotally mounted armature reed which forms the movable element of the motor. A portion of the drive rod projects out the housing of the unit and is accessible for engagement by the operator for overriding the motor to manually effect a controlled snip cutting stroke along substantially the entire portion of the blade.

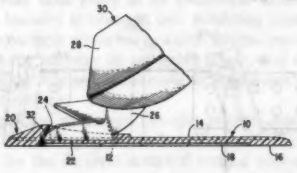


3,698,087

PEDESTAL FOR ELECTRIC SCISSORS

Roy M. Cowdrey, and Wayne A. Current, both of Cranford, N.J., assignors to The Singer Company, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,315
Int. Cl. B26b 15/00
U.S. Cl. 30—228 **6 Claims**



A pedestal for supporting an electric scissors having a housing and a ledger blade mounted at the front of the housing. The pedestal comprises a plastic plate having formed therein a longitudinal slot extending from the upper surface to the lower surface thereof. An integral bridging member longitudinally spans the slot at the upper surface of the plate. A blade-receiving slot is formed in the bridging member for detachably connecting the ledger blade to the pedestal. The blade receiving slot includes an abutment surface against which the ledger blade coacts to prevent the blade from inadvertently withdrawing from the slot. A longitudinal recess may extend along the lower surface of the plate from the termination of the slot to control the amount of springyness of the pedestal. The pedestal is such that it not only supports the scissors on a cutting surface but dampens the vibrations and thus the noise level transmitted from the scissors to the cutting surface.

3,698,088

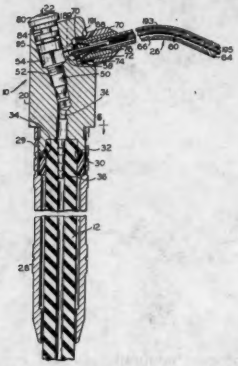
DENTAL SYRINGES

George K. Austin, Jr., 604 Holly Drive, Newberg, Oreg.

Filed Oct. 24, 1969, Ser. No. 869,222
Int. Cl. A61c 19/02
U.S. Cl. 32—22 **12 Claims**

A dental syringe (FIGS. 1–4) includes a head having air and water passages normally blocked by valves opening into a manifold leading to a syringe tip and opened by pushbutton actuators in bores having cupped diaphragms serving to seal

the bores and also serving as springs to return pushbuttons to their normal positions and each serving to draw the fluid back into its own portion of the manifold. Another dental syringe



(FIGS. 5 and 6) has a head with a slide valve selectively positionable to connect either water or a medicament to one valve leading to a manifold.

3,698,089

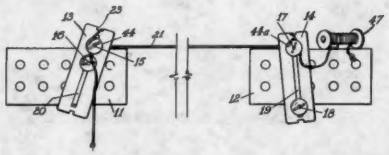
MASON'S GUIDE FOR ALIGNING BUILDING BLOCKS

Charles W. Huston, 6931 Waterloo Road, N.W., Canal Winchester, Ohio

Filed Feb. 3, 1971, Ser. No. 112,344

Int. Cl. B44d *3/00*

U.S. Cl. 33—86 **5 Claims**



A Mason's Guide for Aligning Building Blocks consisting of (1) a clamp element having an aperture, (2) a pair of screws extending through the aperture, and (3) having at one end a pair of washers, one of which is a flat washer and the other of which is a dished washer, (4) nuts on one end of each screw and securing the washers against the clamped element, and (5) a cord secured to the clamp by being interposed between the two washers. The aperture is elongated and the clamp element has a channel parallel with and registering with the aperture on one side thereof. The screws extend through the aperture and are slidable along the length thereof. A nut is threaded on each screw at one end thereof and is positioned in the channel. A wing nut is threaded onto the opposite end of each screw for co-operating with the first named nut which is positioned in the channel for clamping the clamp element between said nuts. The cord is secured at the opposite end thereof to a fixed point and at its nearest end to the clamp by it being wound around the screw between the two washers.

3,698,090

MICROMETER BACKLASH ADJUSTMENT DEVICE

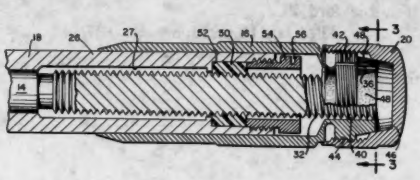
Anthony D. Parone, Elmwood, Conn., assignor to Pratt & Whitney Inc., West Hartford, Conn.

Filed Jan. 13, 1971, Ser. No. 106,002

Int. Cl. G01b *3/18*

U.S. Cl. 33—164 R **2 Claims**

A micrometer embodies an assembly to control the engagement between an annular plastic structure and the threads of a spindle for adjusting the play and backlash between these parts. A compression nut is threadingly secured to the body of a micrometer such that it may be adjusted to compress the



plastic structure to control the engaging contact between the threads of the plastic structure and the micrometer spindle.

3,698,091

OPEN GUN SIGHTS FOR SMALL ARMS

Alvin S. Merrill, Salt Lake City, and Bill J. Rosenhan, Murray, both of Utah, assignors to Moroni Corporation, Salt Lake City, Utah

Filed March 12, 1970, Ser. No. 18,915

Int. Cl. F41g *1/00, 1/32, 11/00*

U.S. Cl. 33—233 **4 Claims**

A gun sight for small firearms having applicability to short and medium range, quick-firing situations and for night-firing has been invented. The gun sight or aiming device comprises a pair of U-shaped sights each having a horizontal opening of substantial width. The horizontal opening of the front sight can be sufficiently wide to permit sighting of a target therethrough under conditions of substantial darkness. The U-shaped rear sight has a horizontal opening sufficiently wide so that at least a portion of the face of the front side on each side of the U-shaped opening can be viewed by an operator aiming the weapon. Also, the front sight may contain on its rear face a pair of rectangular, light-colored patches having sides coextensive with the upper edge of the sight and the vertical interior edge of the sight; each patch being located on opposite sides of the U-shaped opening.

3,698,092

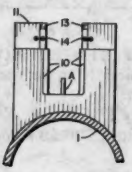
NOVEL ILLUMINATED GUN SIGHTS FOR SMALL ARMS

Bill J. Rosenhan, Murray, Utah, assignor to Moroni Corporation, Salt Lake City, Utah

Filed March 12, 1970, Ser. No. 18,999

Int. Cl. F41g *1/30, 1/32*

U.S. Cl. 33—241 **9 Claims**



An illuminated gun sight for small firearms having applicability to short and medium range, quick-firing situations under conditions of darkness has been invented. The illuminated gun

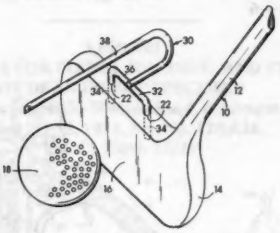
sight or aiming device preferably comprises a pair of open sights, such as U-shaped sights each having a horizontal opening of substantial width. The horizontal opening of the front sight must be sufficiently wide to permit sighting of a target therethrough under conditions of substantial darkness. The rear sight has a preferably horizontal opening sufficiently wide so that at least a portion of the face of the front sight on each side of the opening can be viewed by an operator aiming the weapon. Also, a U-shaped front sight may contain on its rear face a pair of rectangular, light-colored patches having sides coextensive with the upper edge of the sight and the vertical interior edge of the sight; each patch being located on opposite sides of the U-shaped opening. Also, the sights are illuminated by positioning in or near the body of said sights a light source which can be seen by an operator of the firearm when aiming same. A pair of lighted dots are preferably positioned on each sight so that an operator aiming the weapon can view all four spots and may properly align the weapon by aligning the four lighted spots on a horizontal line.

3,698,093

SIGHT ATTACHMENT FOR A GOLF PUTTER

James O. Marshall, East Genesee Turnpike, Fayetteville, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,186
Int. Cl. A63b *53/00*
U.S. Cl. 33—263 **2 Claims**



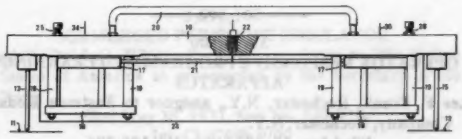
The specification discloses a sighting means for a golf putter, comprising a pointer and a mounting means at least one downwardly directed projection adapted to be inserted into an aperture in the upper surface of the putter head.

3,698,094

TILT METER

Frank Donald Stacey, Kenmore; John Munro William Rynn, Annerley, both of Australia; Eric Cooper Little, Moggill, Great Britain, and Clyde Croskell, Taringa, Australia, assignors to The Universtity of Queensland, St. Lucia, Brisbance, Queensland, Australia

Continuation of Ser. No. 758,720, Sept. 10, 1968, abandoned. This application Jan. 8, 1971, Ser. No. 105,102
Int. Cl. G01c *9/22*
U.S. Cl. 33—366 **13 Claims**



A tilt meter is provided with a horizontally disposed beam that supports on its underside a pair of spaced liquid containers. Insulated electrodes are supported and spaced above each liquid surface and connected to the underside of the beam. The liquids are electrically conductive. A first pipe is provided to communicate the liquid in one container with the liquid in the other container, and a second pipe is provided to communicate the space above each liquid surface with that space above the other.

ERRATUM

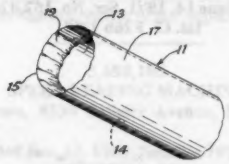
For Class 33—172 R see:
Patent No. 3,699,473

3,698,095

FIBER CONDITIONING ARTICLE

Paul S. Grand, South Bound Brook; Pasquale Joseph Falivene, Union City, and Henry P. Furgal, Bernardsville, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 20, 1970, Ser. No. 82,239
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **12 Claims**



An article for conditioning fibrous materials by contact includes a form-retaining base and, held to an outside surface of the base in form-retaining relationship with it, a flexible material which has an outer surface thereof containing a fiber conditioning agent. Conditioning effected is preferably fabric softening and may take place in an automatic laundry dryer wherein damp laundry is brought into tumbling contact with the conditioning article while being dried. Such contact causes the transfer to the laundry of softening agent and the dried laundry is satisfactorily soft, non-static and unwrinkled, upon removal from the dryer.

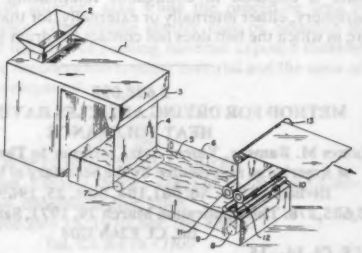
Also disclosed are packages for the articles wherein the form-retaining base is a paperboard cylinder and is employed as a container for the flexible material coated with softening agent.

3,698,096

CONTINUOUS PROCESS OF REMOVING SURFACE WATER FROM PLASTIC SHEET MATERIAL

John M. Wininger, Jr., Blountville, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 877,328, Nov. 17, 1969, abandoned. This application Feb. 1, 1971, Ser. No. 111,462
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **10 Claims**



Polyolefin, polyester and cellulose ester plastic sheet products produced at high production rates without optical or visible defects by extruding the plastic in the molten state into

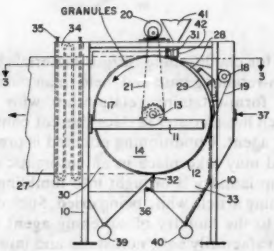
a water quench bath, and completely removing surface water from the quenched sheet. This is accomplished according to the instant invention by heating the sheet immediately after it leaves the quench bath to impart internal heat thereto, removing surface water by conveying the wet sheet through a pair of squeeze rolls which hold back the bulk of the excess water and spread any water not thus removed in a layer of minute thickness over both surfaces of the sheet, and thereafter conveying the heated sheet from the exit side of the squeeze rolls for a sufficient distance and a sufficient interval to permit the internal heat previously imparted to the sheet to evaporate all remaining water therefrom.

3,698,097

METHOD AND APPARATUS FOR TREATING GRANULAR MATERIAL

Gustav A. Maag, Crestview Hills, Ky., and Donald L. Gerth, Springfield Twsp, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 14, 1971, Ser. No. 152,826
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **16 Claims**



A method and apparatus for continuously treating granular material for the purpose of heating, cooling and/or drying the material. An endless belt of fine mesh fabric is supported around a treating drum having a perforated peripheral surface. The belt is moved by the rotation of the drum. A layer of granular material is continuously deposited on the surface of the moving belt. A fluid treating medium, preferably air, is continuously drawn through the belt and drum periphery whereby it passes through the granular material and simultaneously creates a sufficient pressure differential to retain the granular material on the belt as it moves through a substantial arc of rotation. The treating medium can heat, cool and/or dry the granules depending upon the desired treatment. A sealing plate is disposed in contiguous relationship to the drum periphery, either internally or externally, for that portion of its arc in which the belt does not contact the drum periphery.

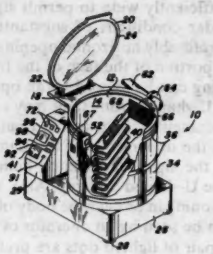
3,698,098

METHOD FOR DRYING ARTICLES HAVING A LOW HEAT TOLERANCE

James M. Ramsay, Yuma, Ariz., assignor to The United States of America as represented by the Secretary of the Navy

Division of Ser. No. 861,104, Sept. 25, 1969, Pat. No. 3,605,278. This application March 29, 1971, Ser. No. 129,062
Int. Cl. F26b *5/04*
U.S. Cl. 34—15 **2 Claims**

A method for drying articles having a low heat tolerance, such as parachutes fabricated of synthetic fibers, comprising the steps of first heating a hermetically sealable chamber to a predetermined temperature which the article can tolerate, then evacuating the chamber to create a vacuum therein for substantially reducing the boiling-point of any moisture in the article, and exhausting the boiled-off moisture to complete the drying cycle.

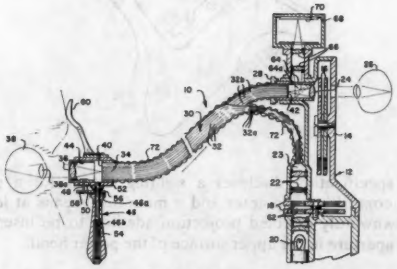


3,698,099

OPHTHALMOSCOPES

Thomas T. Matsura, Tokyo, Japan, assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 29, 1971, Ser. No. 110,858
Int. Cl. A61b *3/12, 3/14*; G02b *5/16*
U.S. Cl. 351—6 **6 Claims**



An instrument for selectively performing direct and photographic ophthalmoscopy including a variable focus image-forming objective at one end of an elongated flexible illuminating and image-transporting bundle of optical fibers having an image-viewing eyepiece and associated ophthalmoscopic optics adjacent its opposite end for diagnostically viewing images transported by the optical fiber bundle and a camera associated with said eyepiece for selectively photographically recording images transported by said flexible bundle of optical fibers.

3,698,100

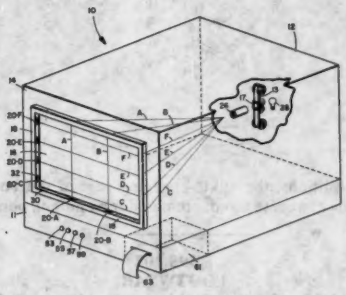
OPERATOR RESPONSIVE PROGRAMMED LEARNING APPARATUS

Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,276
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 A **13 Claims**

In a rear projection viewer for showing a programmed viewing web having encoded frames thereon, light beams are directed across the face of a display screen onto photodetectors located about its periphery. A student can indicate a response to a projected answer coded scene, such as a

question, by presenting a finger or other object at the face of the display screen at a selected answer point, thereby interrupting a light beam or beams. The photodetectors are connected to correlating circuitry which compares the student's response with information coded on the scene's frame. The next scene presented is program selected in accordance with what response the student registered.

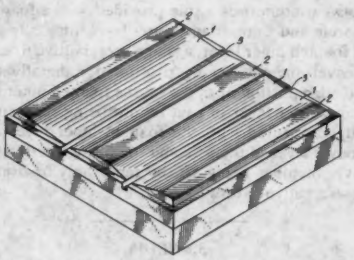


3,698,101

CONTAINERS FOR FIXING, HOLDING, AND STORAGE OF DEAD INSECT SPECIMEN

Clarence C. Bowling, 1750 Wooten Road, Beaumont, Tex.

Filed Feb. 8, 1971, Ser. No. 113,434
Int. Cl. G09b *23/36*
U.S. Cl. 35—20 **3 Claims**



A light weight container molded of penetrable material for spreading, fixing, holding, and storage of dead insect specimen.

3,698,102

SUBMERGED PERISCOPE SIMULATOR

Carl R. Driskell, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 28, 1971, Ser. No. 147,918
Int. Cl. G09b *9/00*
U.S. Cl. 35—25 **5 Claims**

An improvement to a periscope view simulator training device for training periscope operators. Comprises means for simulating the changing view obtained through a periscope when the periscope head is ascending from the darker ocean depths through lighter greenish colored waters near the surface and on to the daylight brightness of an above the surface position. Also simulates the view obtained when the periscope

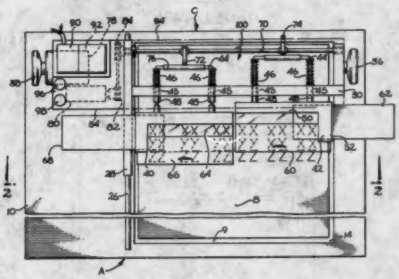
head descends from an above the ocean surface position down through the near-surface waters to the depths.

3,698,103

SPEED READING MACHINE

Peter E. Harmon, 4339 Bellaire Avenue, North Hollywood, Calif.

Filed Jan. 13, 1969, Ser. No. 790,760
Int. Cl. G09b *17/04*
U.S. Cl. 35—35 **6 Claims**



A device for developing reading speed and comprehension comprising a variable speed pacing member which traverses a page of reading material from the top to the bottom thereof in a series of predetermined steps or hesitations. The pacing member includes a plurality of cam-actuated spacing shutters which, when viewed from above, sequentially expose laterally adjacent areas of the underlying reading material so that during each hesitation, or step, of the pacing member, the reader sees first one area of the reading material, while the like area adjacent thereto is blocked from view; and then, in sequence, sees the laterally adjacent area while the preceding area is blocked from view. The pacing shutter may be adjusted to vary the size of the area of reading material exposed thereby according to the nature of the reading material and the state of the trainee's development.

3,698,104

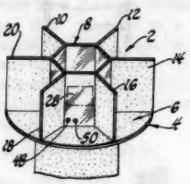
PORTABLE STUDY CARREL

Thomas J. Sutton, Livonia, Mich., assignor to Oakland Community College, Bloomfield Hill, Mich.

Filed July 15, 1970, Ser. No. 55,182
Int. Cl. A47b *41/00*
U.S. Cl. 35—60 **3 Claims**

A study carrel including a horizontal work surface with a hollow core unit projecting upwardly from the work surface and a plurality of vertical side panels extending outwardly from the peripheral surface of the core member toward the

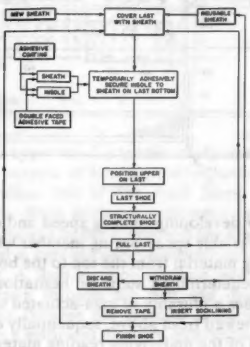
peripheral edge of the work surface to define a plurality of work stations. Each of the work stations is enclosed by an adjacent pair of side panel surfaces, the portion of the outer surface of the core unit that extends between the adjacent pair of side panel surfaces, and the corresponding portion of the horizontal work surface that extends between the adjacent pair of side panel surfaces.



3,698,105
LASTING ELEMENT

Jerome A. Rubico, Boston, and Charles F. Batchelder, Milton, both of Mass., assignors to Batchelder Rubico, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 805,205, May 7, 1969, Pat. No. 3,525,110. This application Aug. 24, 1970, Ser. No. 66,212
Int. Cl. A43b
U.S. Cl. 36—2.5 R **5 Claims**



A method for making shoes over a sheathed last using a lasting element. In one embodiment of the invention, the lasting element comprises a single layer of a very thin and relatively flexible material while in another embodiment, the lasting element comprises a laminated structure.

3,698,106
SKI BOOT

Justus Rieker, Panoramastrasse 130, 7200 Tuttlingen, Germany

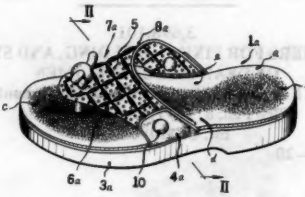
Filed May 24, 1971, Ser. No. 146,359
Claims priority, application Germany, June 23, 1970, P 20 30 737.3
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **13 Claims**

A ski boot is described having interchangeable ankle-engaging parts inclined at differing angles to the remainder of the boot for matching the desired angular inclination of skier's lower leg and ankle to the foot in accordance with different skiing conditions; the ankle-engaging part of the boot being detachably connected to the remainder by plug-in connectors.

3,698,107
FOOTWEAR

Tatsuo Fukuoka, 3,3-Ban, 2-chome, Shin-Minami, Tokushima, Japan

Filed Feb. 12, 1971, Ser. No. 114,844
Claims priority, application Japan, Oct. 19, 1970, 45/104050; Nov. 12, 1970, 45/112294
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **9 Claims**



A footwear comprises a sole provided with a foamed inner layer therein and a non-foamy outer layer integrally surrounding said foamed inner layer, a shape preservative fixture for an instep cover member being protruded integrally from the required edge portion of said sole, the foamed inner layer and non-foamy outer layer of said fixture being respectively and integrally connected with the foamed inner layer and non-foamy outer layer of the sole and the fitting portion of the instep cover member being affixed removably or firmly to the shape preservative fixture.

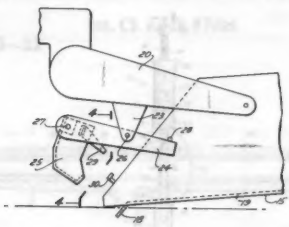
3,698,108
SANDALS AND METHODS AND MACHINES FOR THEIR MANUFACTURE

Adolf Brunner, Vienna, Austria, assignor to Semperit Osterreichisch-Amerikanische Gummiwerke A.G., Vienna, Austria

Filed March 6, 1970, Ser. No. 17,186
Claims priority, application Austria, March 6, 1969, A 2198
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **10 Claims**

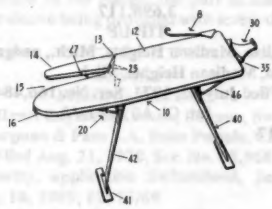
The sandal is made of a foam rubber or a foam plastic sole within which a central portion of a single-piece fastening strip of a non-moldable material is embedded. The sole is manufactured in a mold having lateral recesses for insertion of the fastening strip prior to the molding process.

3,698,109
COVER PLATE ATTACHMENT FOR ELEVATING SCRAPER
Charles Davis, Farmingdale, N.Y., assignor to Davis Construction Corporation, Hicksville, N.Y.
Filed Aug. 16, 1971, Ser. No. 172,022
Int. Cl. E02f *5/00*
U.S. Cl. 37—124 **5 Claims**



A cover plate attachment for an elevating scraper which has a closed position for closing the open end of the scraper bowl when the scraper is in the raised or transport position and an open position allowing access to the open end of the scraper bowl when the scraper is in lowered position and the cutting edge of the bowl is in ground engagement; said cover plate being shiftable automatically and positively between said positions upon the raising or lowering of said scraper.

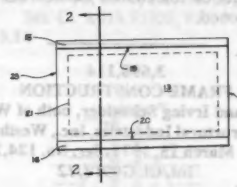
3,698,110
DOMESTIC IRONING BOARD
Ralph E. Shettel, Route 1, Twin Falls, Idaho
Filed Aug. 3, 1970, Ser. No. 60,242
Int. Cl. D06f *81/00*
U.S. Cl. 38—107 **3 Claims**



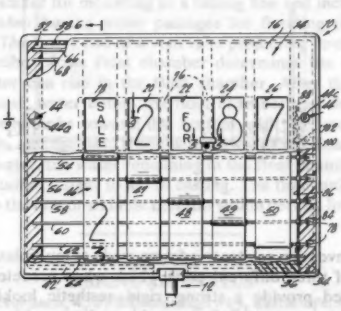
An ironing appliance offering a mini-board means built into the parent contour disposed to selectively swing outwardly for use. In the closed position, it serves to enlarge the board extremity and thereby speed up the ironing chore through reduced manipulation of the work. A control is provided to support and lever a desired position. Understructure leg supports are set apart to provide knee space and work with board extremity bracing to produce an unobstructed separation between the mini-board and the ironing board. A snap on cord curbing unit and flatiron arrestor are accessories that attach the board and complete the ironing appliance in eliminating rumpling of the work by the cord while giving the flatiron safe rest and storage.

3,698,111
DOCUMENT HOLDER
Thomas R. Smith, Newton, Iowa, assignor to Pyramid, Inc., Newton, Iowa
Filed Feb. 8, 1971, Ser. No. 113,260
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 R **4 Claims**

A generally rectangular document holder comprising a pair of flexible film-like transparent sheets fixed along opposite sides to a pair of elongated magnetic strips. The document holder will receive and retain a document such as an automobile registration to permit displaying the document in a suitable location within the automobile.

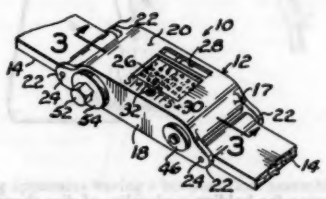


3,698,112
VARIABLE INDICIA SIGN
John J. Kelly, 2 Normandie Place, Cranford, N.J.
Filed Dec. 1, 1970, Ser. No. 93,999
Int. Cl. G09f *11/26*
U.S. Cl. 40—96 **8 Claims**



A variable indicia sign for use in retail merchandising and the like which has a plurality of windows through which shopper sees indicia such as price. The indicia in each window is formed on a continuous tape, the position of which is controlled externally and which can be varied by the merchandiser to accurately and selectively bring into view the desired information. The structure of the device allows for easy adjustment by authorized personnel but effectively precludes customers from varying the indicia.

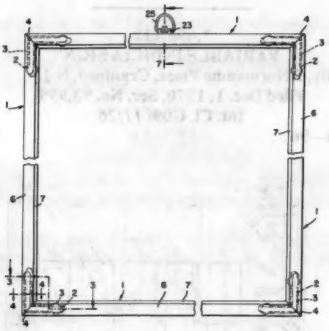
3,698,113
PERPETUAL CALENDAR
Lauren D. Spicer, c/o Arthur Jaqua R.R. #1, Napoleon, Ohio
Filed April 8, 1971, Ser. No. 132,453
Int. Cl. G09d *3/10*
U.S. Cl. 40—118 **5 Claims**



A substantially rectangular hollow case is connected at its respective ends with strap means encircling a user's wrists. Cog wheels and rollers are journalled within respective end

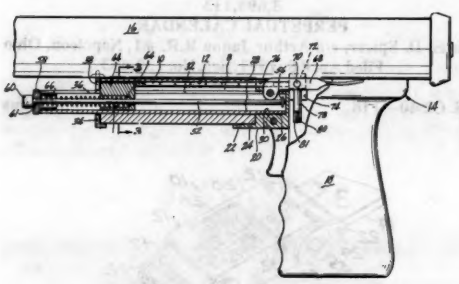
portions of the case on transverse axles for supporting superposed endless bands having calendar data printed thereon. Openings, formed in opposing surfaces of the case walls, expose calendar data on the endless bands when the bands are selectively positioned.

3,698,114
FRAME CONSTRUCTION
Stanley Hirsch, and Irving Schneider, both of Westbury, N.Y., assignors to Structural Industries, Inc., Westbury, N.Y.
Filed March 15, 1971, Ser. No. 124,166
Int. Cl. G09f 1/12
U.S. Cl. 40—155 **8 Claims**



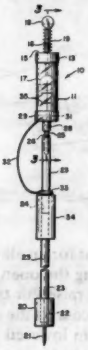
The invention relates to a frame made of multiples of a maximum of three different parts which when predeterminately assembled provide a strong, rigid aesthetic looking frame which requires no tools for assembly or disassembly.

3,698,115
TUBULAR MAGAZINE AND DISPENSER THEREFOR
Robert W. Henning, North Haven, Conn., assignor to Olin Corporation
Filed Dec. 2, 1970, Ser. No. 94,386
Int. Cl. F41c 25/08, 25/00; B25c 1/10
U.S. Cl. 42—49 R **9 Claims**



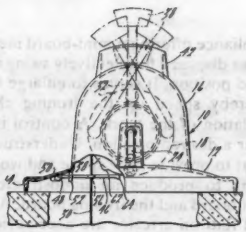
A magazine for holding a plurality of disc-shaped articles comprising a tubular body having a plurality of annularly spaced, T-shaped tracks communicating with the interior of the body. Also, a dispenser whereby an article may be individually dispensed from the magazine.

3,698,116
FISH BITE SIGNALING DEVICE
Stewart N. Rosier, P.O. Box 366, Dover R.D. 2, Washington Twp., York County, Pa.
Filed July 7, 1971, Ser. No. 160,351
Int. Cl. A01k 97/12
U.S. Cl. 43—17 **12 Claims**



A fish bite signaling device wherein the flexing movements of the outboard end of a fish pole incident to fish bite activity on a fish line attached to said pole are converted into variations in the level of liquid within a container operatively associated with said fish pole together with calibrated indicia for evaluating the strength or vigor of the fish bite in terms of rise of liquid level within said container.

3,698,117
TIP-UP
Donald G. Wiltse, Madison Heights, Mich., assignor to Topper Corporation, Madison Heights, Mich.
Filed July 27, 1971, Ser. No. 166,484
Int. Cl. A01k 97/12
U.S. Cl. 43—17 **9 Claims**



A tip-up for use in ice fishing which comprises a housing containing a rotatable reel having a fishing line wound thereon, a crank for rotating the reel, a signal member pivoted on the reel on an axis offset from the axis of rotation of the reel and extending through a slot in the housing, the upper end of the signal member having a visual signal portion which oscillates externally of the housing when a fish takes the line off of the reel, and means for yieldably resisting unwinding of the reel. The housing is hollow and is adapted to completely cover the hole in the ice to retard freezing of the water therein.

3,698,118

DEVICE FOR ATTACHING FISHING REELS TO FISHING TACKLES

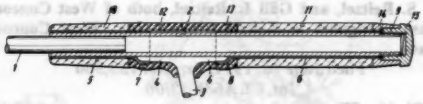
Rudolf Schultz, Berlin, Germany, assignor to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Huntze Gesellschaft mit beschrankter Haftung & Co. Kammanditgesellschaft, Berlin, Germany

Filed Oct. 23, 1969, Ser. No. 868,765

Claims priority, application Germany, Oct. 25, 1968, G 68 04 685.5

Int. Cl. A01k *87/06*

U.S. Cl. 43—22 1 Claim



A fishing reel having a T-shaped base is attached to a fishing tackle the handle of which has the shape of a hollow cylindrical tube with two cylindrical sleeves mounted on the handle and movable relatively to each other. The sleeves are located on opposite sides of the reel base and each of them has a shoe-like extension with an inclined surface extending over a separate flange of the base. Each sleeve is enclosed by a cover which is a poor conductor of heat. The sleeves and their covers are held by a cap which can be screwed upon the reel handle, whereby the base is firmly clamped. The cap has an annular space for receiving a rotary radial flange located upon that side of the sleeve which is opposite its shoe-like extension. The present invention is particularly characterized in that the cap consists of two parts which engage each other while forming an annular space and which are rigidly interconnected after the insertion of the flange, the part of the cap located away from the sleeve being provided with screw threads.

3,698,119

FISHING TACKLE

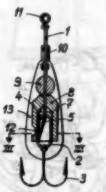
Francis Jean Henri Raymond Levoin, Lugano, Switzerland, assignor to Carpano & Pans S.A. Boite Postale, Cluses, France

Filed Aug. 21, 1970, Ser. No. 65,966

Claims priority, application Switzerland, June 4, 1970, 8513/70; Aug. 18, 1969, 12575/69

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.08 8 Claims



An artificial bait for fish includes a body having a cavity for receiving a looped portion of a resilient pin. The loop releasably supports a hook and at the extremity of one free end of the pin forming part of the loop, has an outwardly formed part which engages a surface of a ledge formed in the cavity to resiliently resist movement of the pin away from the body. The ledge is formed by the junction of a hole formed in the body laterally of, and communicating with, the cavity.

3,698,120

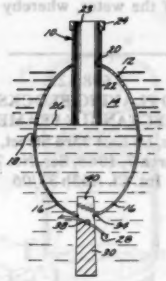
FLOAT-SINKER

Daniel R. Grogan, 705 West 39th Street, San Pedro, Calif.

Filed Nov. 16, 1970, Ser. No. 89,767

Int. Cl. A01k *93/00, 95/00*

U.S. Cl. 43—43.14 12 Claims



A float-sinker for mounting to a fishing line and including a float chamber having water passages for flooding the float chamber. The lower end of a vent tube projecting through the upper portion of the float chamber determines the level to which water can rise in the float chamber. After the float-sinker is cast, water enters the float chamber and the float-sinker slowly sinks toward the bottom with the associated hooks, bait, and the like. Upon withdrawal of the float-sinker from the water, the water remaining in the float chamber provides additional weight to aid in casting. The float-sinker may be fixed to the line or slidable thereon within certain limits.

3,698,121

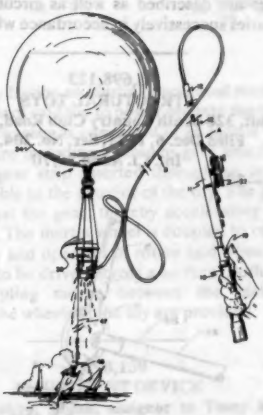
FISHING APPARATUS

Gerald C. Nordeen, 4509 Ritchie Highway, Baltimore, Md.

Filed May 11, 1971, Ser. No. 142,311

Int. Cl. A01k *93/00*

U.S. Cl. 43—43.14 3 Claims



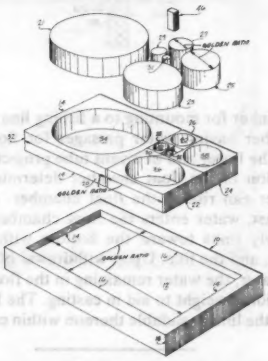
A fishing apparatus having a buoyant float assembly consisting of a container and an inflated lighter than air balloon to be positioned over a fishing area, the container adapted to be initially filled with water to render the float assembly sufficiently buoyant so as to float on water; the float assembly having a conventional depending fishhook and having a hollow flexible

tube forming a line adapted to be carried upon a reel having one end attached to the container thereof and connected to a fishing pole, a source of inert gas under pressure in the fishing pole and valve means on the fishing pole to manually release the gas through the hollow tube and into the container to force the water therefrom and thus lighten the float sufficiently to cause the balloon portion to lift the container, the attached hook and any fish which may be caught thereon, to a point adjacent the surface of the water, whereby the fisherman may reel in his catch.

3,698,122
GOLDEN RATIO PLAYING BLOCKS AND GOLDEN RECTANGLE FRAME

Wilbur Henry Adams, 66 East 83rd Street, New York, N.Y.

Filed March 7, 1968, Ser. No. 711,255
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **2 Claims**

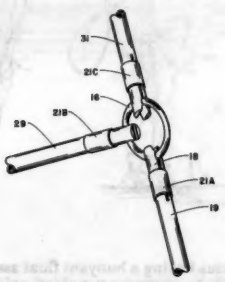


A set of playing blocks is described wherein blocks of different sizes are provided with characteristic dimensions that bear a preselected golden ratio relationship with one another. Blocks of successive sizes are related to each other with the Golden Ratio. The Golden Ratio is defined as the ratio between successive numbers in a sequence produced by starting with one and adding the last two numbers to arrive at the next. Blocks of rectangular shape bearing the Golden Ratio to one another are described as well as circular blocks whose diameter varies successively in accordance with the sequence.

3,698,123
STRUCTURAL TOYS

Carl R. Heldt, 320 South Country Club Road, Tucson, Ariz.

Filed Dec. 6, 1971, Ser. No. 204,896
Int. Cl. A63h *33/10*
U.S. Cl. 46—29 **8 Claims**



A round rod is bifurcated at both ends in a plane. Near each end, in the plane, a hole is drilled. Each end is slotted in the plane back from the hole for a short distance. Small round rods are provided having the diameter of the hole. Short lengths of tubing are provided to fit over the bifurcated round rod.

When a small rod is placed in one of the holes in the bifurcated rod and the tubing is slid toward the small rod, the latter is locked in place in the jaws of the bifurcation.

Small tori are provided, made of round stock having the diameter of the holes in the round rod; these tori can be placed in jaws of the bifurcated rod, instead of the small rods.

Small wheels having rims of the size of the holes in the rod also are provided.

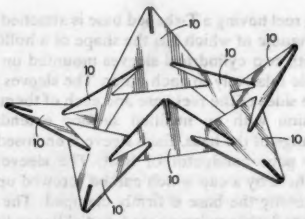
Long tubes also are provided to connect two bifurcated rods and to act as locks.

Out of these elements extensive rigid structures can be built.

3,698,124
CONSTRUCTION TOY

John S. Reitzel, and Gail L. Reitzel, both of West Concord, Mass., assignors to Reitzel Designs, Inc., West Concord, Mass.

Filed June 16, 1971, Ser. No. 153,500
Int. Cl. A63h *33/06*
U.S. Cl. 46—30 **6 Claims**

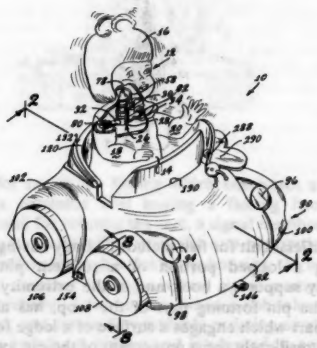


A construction toy having a plurality of equilateral triangular construction elements adapted to be sequentially interlocked together to create a variety of free form constructions. Each triangle is transparent, flexible, made of resilient plastic, and has locking slots extending from the triangle vertices toward the triangle centroid. The locking slots have a working width less than the triangle thickness which allows the triangles to be firmly interlocked together. The locking slots also have a length of approximately three-sevenths of the distance from a triangle vertex to the triangle centroid.

3,698,125
ANIMATED FIGURE TOY

Donald C. Hartling, Garden Grove; Joseph Kossoff, Hawthorne, and William Radin, Palos Verdes Peninsula, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

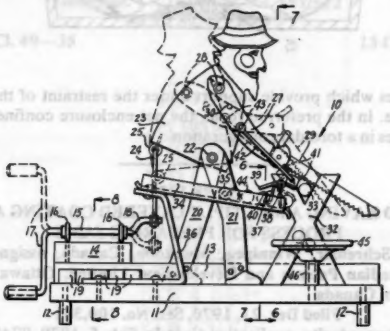
Filed March 2, 1970, Ser. No. 15,539
Int. Cl. A63h *5/00*
U.S. Cl. 46—118 **7 Claims**



A doll includes a torso to which a head and arms are resiliently connected for movement with respect to the torso

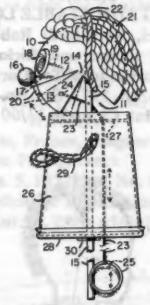
when the doll is jiggled or bounced. The doll is seated on a seat which is rocked from side-to-side by a suitable motor provided in a toy vehicle, musical instrument or the like.

3,698,126
ANIMATED TOY
Wolfe Grebow, 8402 Carlson Lane, Baltimore, Md.
Filed June 28, 1971, Ser. No. 157,498
Int. Cl. 163h *11/00*
U.S. Cl. 46—119 **5 Claims**



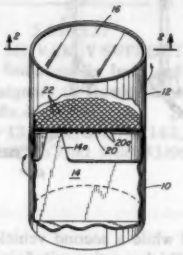
An animated toy simulating a wood cutter sawing a log when actuated by a hand crank. On each stroke of the saw a simulated log section is dropped from a point near the sawing operation simulating the cutting off of a section of log.

3,698,127
DOLL-LIKE PUPPET WITH MOVABLE MOUTH
Grace E. Harp, 100 Belhaven Drive, Los Gatos, Calif.
Filed Feb. 4, 1971, Ser. No. 112,569
Int. Cl. A63h *7/00*
U.S. Cl. 46—126 **2 Claims**



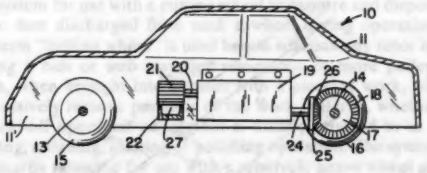
A puppet with a substantially spherical head having a movable mouth which is operated by a pull string. The string is attached to the lower jaw if the lower jaw is to be moved or it is attached to the upper part of the head if the upper part of the mouth is to move with respect to the lower part. The head is supported upright on a rod extending downward therefrom so that the lower end of the rod may be gripped to hold the puppet upright or said lower end may be set into a support. The head may be rotated with respect to the cup-shaped member by rotating the rod and suitable arms may be attached to the cup-shaped member so that this member appears as the upper part of the puppet body.

3,698,128
AMUSEMENT DEVICE PRODUCING SOUND WITH VISUAL REINFORCEMENT
Alan J. Moeser, Roosevelt, N.J., assignor to Columbia Broadcasting System, Inc.
Filed Feb. 24, 1971, Ser. No. 118,373
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 **8 Claims**



An action toy for young children which produces a clicking or popping sound accompanied by a popping action imparted to a number of small objects, such as tiny balls, as the toy is manipulated with the hands.

3,698,129
TOY VEHICLES
Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.
Continuation of Ser. No. 53,832, July 10, 1970, abandoned.
This application Jan. 24, 1972, Ser. No. 220,273
Int. Cl. A63h *11/10*
U.S. Cl. 46—202 **5 Claims**

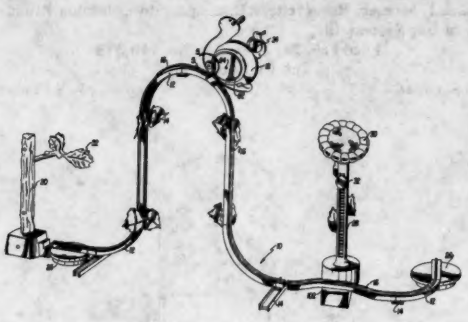


A vehicular toy having an inertially operated mechanism for driving the wheels of said toy to power operate the toy across a surface. The mechanism is composed of an inertia wheel having an input means including a circular gear which is rotated by means of a gear strip inserted through an opening and guideway accessible to the exterior of the toy. The gear strip is pulled rapidly past the gear, thereby accelerating the inertia wheel of the toy. The inertia wheel is coupled to one or more wheels of the toy and operates to rotate said wheel or wheels to cause the toy to be driven across a surface. Both direct and clutch-type coupling means between the inertia wheel mechanism and the wheels of the toy are provided.

3,698,130
AMUSEMENT DEVICE
Hikoo Usami, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1971, Ser. No. 193,310
Claims priority, application Japan, Dec. 28, 1970, 45/136625
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **6 Claims**

An amusement device featuring a trackway along which a vehicle moves including automatic turn-around sections at the

ends of the trackway permitting the vehicle to reverse its direction of travel and a stand wherein the movement of the



vehicle is halted while a second vehicle traverses the stand after which the vehicle continues its forward motion.

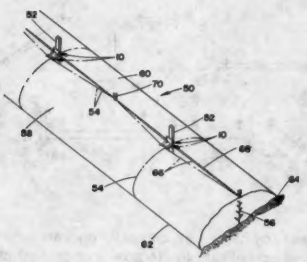
ERRATUM

For Class 46—135 R see:
Patent No. 3,698,134

3,698,131
PLANT COVER AND METHOD

Donald A. Kesinger, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed March 31, 1971, Ser. No. 129,772
Int. Cl. A01g *13/04*; E05f *15/20*
U.S. Cl. 47—29 **11 Claims**



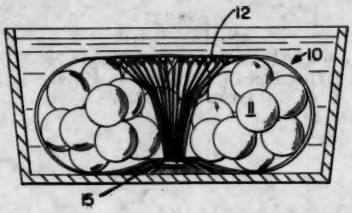
A plant cover having a thermally responsive actuator for venting purposes. The actuator includes a hermetically sealed plyable bag containing an amount of vaporizable liquid that when vaporized expands the bag to effect actuator actuation. A method of growing plants using the plant cover of the invention including planting in an earthen trough and covering the trough with a plant cover of the invention.

3,698,132
VARIABLE DISPLACEMENT HOLDER

Lawrence E. Green, Stinson Beach, and William G. McDermott, Sausalito, both of Calif., assignors to McDermott & Green, Inc., San Francisco, Calif.

Filed Dec. 23, 1971, Ser. No. 211,436
Int. Cl. A01g *5/00*; B65d *29/04*
U.S. Cl. 47—41.13 **5 Claims**

A variable displacement holder and support for flower stems, pencils, hors d'oeuvre sticks, etc. formed with a plurality of marbles and a net enclosure formed with the mesh large enough to permit insertion of stems of various size through the net openings but small enough to contain the marbles. A net enclosure surrounds and loosely contains the marbles so that stems can be inserted through the net openings to displace the



marbles which provide support under the restraint of the enclosure. In the preferred form, the net enclosure confines the marbles in a toroidal configuration.

3,698,133
SEED HAVING A MULTIPLE LAYERED COATING AND PROCESS FOR PREPARING SAME

Kurt Schreiber, Winnipeg, Manitoba, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Dec. 21, 1970, Ser. No. 100,381
Claims priority, application Canada, Feb. 5, 1970, 074077
Int. Cl. A01c *1/06*
U.S. Cl. 47—57.6 **25 Claims**

A plant seed having a multiple coating thereon, said multiple coating comprising (1) an inner porous coating which is permeable to water comprising a water insoluble particulate material dispersed throughout a water soluble binder and (2) an applied outer coating of a non-elastomeric material, such as a polymer, said material in film form having a controlled permeability to water and an elongation to breaking less than about 250 percent and said coating being of a thickness such that it will control the water imbibition of the seed to the extent necessary to delay germination until environmental conditions are satisfactory to continued crop growth.

3,698,134
DOLL HAVING ADJUSTABLE LOCK OF HAIR

Francis Robert Amici, Northford; Robert E. David, North Branford, both of Conn., and Richard Levine, Howard Beach, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,262
Int. Cl. A63h *11/00*
U.S. Cl. 46—135 R **10 Claims**

The specification discloses an improved arrangement for controlling the degree of exposure of a long lock of hair from the head of a doll. Through the provision of a rotatable spindle to which the lock of hair is attached, the lock of hair is

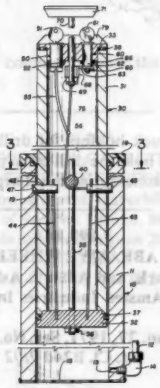
manually adjusted by turning the spindle against a complementary locking ratchet arrangement. A reel whose diameter is much larger than that of the spindle is mounted for free rotation with respect to the spindle. As the spindle is rotated, the lock of hair eventually contacts the reel causing it to rotate to a point limited by stops formed in the interior of the doll.

3,698,135

VEHICLE PARKING SPACE LOCKING DEVICE

Patrick R. Boots, and Kenneth W. Gaddis, both of Houston, Tex., assignors to Scope Lock, Inc., Houston, Tex.

Filed Sept. 17, 1971, Ser. No. 181,512
Int. Cl. E01f *13/00*
U.S. Cl. 49—35 **13 Claims**



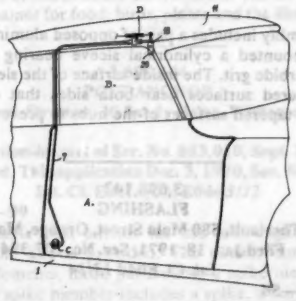
A device for use with a substantially unenclosed parking space to selectively permit ingress and egress from the parking space comprising an erectable barrier means operatively mounted in the surface of the associated parking space for selectively raising and lowering. The device is provided with dual locking means, each of which permits locking and unlocking of the erectable barrier means in the raised position. One of the locking means is adapted to allow release of the erectable barrier means from the remainder of the device for repair or replacement.

3,698,136

LATERAL ABUTMENT DEVICES FOR VEHICLE WINDOWS

Albert Grosseau, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jan. 5, 1971, Ser. No. 104,061
Claims priority, application France, Jan. 12, 1970, 7000905
Int. Cl. E05b *65/061*
U.S. Cl. 49—394 **4 Claims**



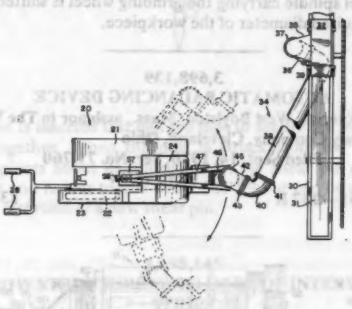
A device for preventing the lateral movement of the side windows of a motor vehicle. A sensing and transmitting device is mounted on the side rail of the door and is actuated by the closing of the door. The sensing and transmitting device is connected to a receiver by a fluid circuit, the fluid being a liquid under pressure. The fluid transmitted by the sensing and transmitting device causes the receiver to act on a latching member through a push-rod to move the latching member into position on the opposite side of the window from the sealing member thereby providing an abutment preventing the lateral movement of the window.

3,698,137

GRINDER WITH MOVABLY SUPPORTED FRAME

Robert C. Overmyer, Indianapolis, Ind., and John R. Scheel, Ocqueoc, Mich., assignors to Hawley Manufacturing Corporation, Indianapolis, Ind.

Filed July 13, 1971, Ser. No. 162,240
Int. Cl. B24b *7/00, 9/00, 55/06*
U.S. Cl. 51—99 **10 Claims**



A system for use with a cutting wheel to capture and dispose of the dust discharged from such a wheel during operation. The term "cutting wheel" is used herein to mean any rotor including a belt or web traveling about one or more pulleys which, when brought into contact with a piece of work, will progressively remove particles of the work material, whether in a cut-off operation or in what is usually referred to as a grinding, abrading, shaping or polishing operation. The system is primarily intended for use with a relatively heavy wheel assembly which is supported, with its motive power, for limited, substantially universal movement relative to the work, and comprises a continuously-evacuated, elongated duct, a car defining a chamber continuously in communication with the interior of the duct as it moves along the length of the duct, an air scoop positioned in or near the stream of dust emanating from the wheel during operation and an articulated conduit providing communication and a driving connection between the scoop and the car.

3,698,138

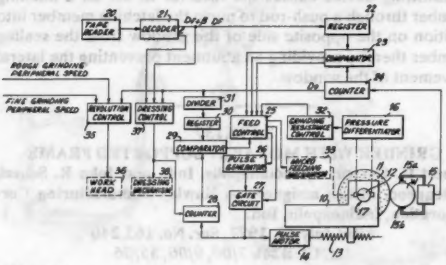
GRINDING MACHINE WITH ADAPTIVE CONTROL SYSTEM

Ryuzi Wada; Keiichi Nakamura, both of Kariya, and Kimio Kanou, Aichi-ken, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha

Filed Aug. 10, 1970, Ser. No. 62,300
Claims priority, application Japan, Aug. 13, 1969, 44/64373
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.8 **22 Claims**

A grinding machine operative for controlling the feeding speed of a wheel slide to obtain high machining accuracy and efficiency, incorporating a sizing device for constantly measuring the diameter of a workpiece during a grinding operation thereon and directs feed control means to change the feed speed of the wheel slide. A grinding resistance control means

is provided for detecting the grinding resistance applied on the grinding wheel and supplies the feed control means with the detected grinding resistance in a rough grinding stage at a predetermined value. For the final grinding operation, the axis of a wheel spindle carrying the grinding wheel is shifted to obtain a required diameter of the workpiece.

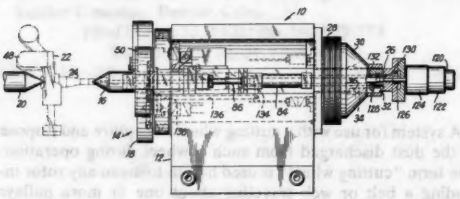


3,698,139

AUTOMATIC BALANCING DEVICE

Cecil D. Everett, West Boylston, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 14, 1970, Ser. No. 71,760
Int. Cl. B24b *41/04*
U.S. Cl. 51—237 R 13 Claims



An automatic balancing device for use on a machine tool adapted to perform the same or a similar machining operation on a series of differently balanced workpieces. The workpieces are received at the machine tool in a random sequence and the machine tool performs a common automatically cycled machining operation upon each workpiece while it is supported by a workpiece holder in the machine tool. The workpiece holder is mounted within a fixed housing on the machine tool for rotation about a predetermined axis during each machining operation and the machine tool is stopped between succeeding machining operations to allow a workpiece to be loaded and unloaded. The balancing device includes a balance weight which is automatically movable between supports therefor on the workpiece holder and on the housing in response to a signal indicating that succeeding workpieces delivered to the workpiece holder are differently balanced about the axis of rotation of the workpiece holder.

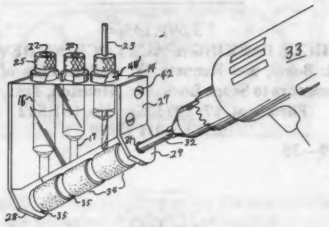
3,698,140

DRILL BIT SHARPENING MECHANISM FOR USE IN CONJUNCTION WITH HAND DRILLS

Rufus F. Steadman, 2530 South Congress, Austin, Tex.

Filed Dec. 30, 1970, Ser. No. 102,801
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 G 12 Claims

A compact and highly portable mechanism for sharpening standard drill bits with the grindstone, all tools and associated hardware built in to the device and motive power supplied by attachment of a conventional hand drill with provision for adjustment of the angle of interaction between the rotatable grind stone and the face of the drill bit to preserve the original cutting angle of each of the drill bit biting surfaces. The device is provided with chuck holders for drill bits of varying sizes and guide structures hold the drill bit in proper alignment with respect to the grindstone during the sharpening operation.

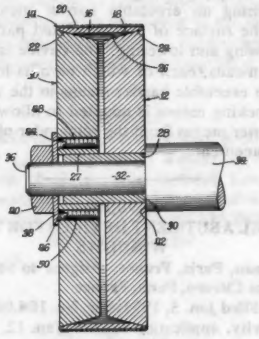


3,698,141

MODULAR ABRASIVE WHEEL ASSEMBLY

Kenneth L. Landmark, and Allan J. Ashley, both of Geneva, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 27, 1971, Ser. No. 110,010
Int. Cl. B24d *9/02*
U.S. Cl. 51—372 4 Claims



The assembly includes a pair of opposed aluminum hubs on which is mounted a cylindrical sleeve bearing particles of tungsten carbide grit. The inside surface of the sleeve has outwardly tapered surfaces near both sides that engage corresponding tapered surfaces of the hubs to prevent rotational slipping.

3,698,142

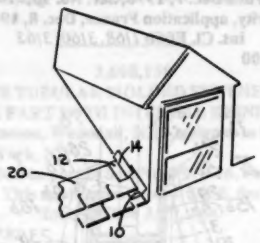
FLASHING

George R. Theriault, 580 Main Street, Orange, Mass.

Filed Jan. 18, 1971, Ser. No. 107,394
Int. Cl. E04d *13/14*
U.S. Cl. 52—58 1 Claim

Flashing comprising a sheet bent into a general "V" shape for disposition on a shingle and against the side to be flashed,

said sheet having a cut-back and bent under lip portion at one end thereof for insertion under the top edge of the shingle, the



lip portion forming a connection with the shingle without the use of fasteners.

3,698,143

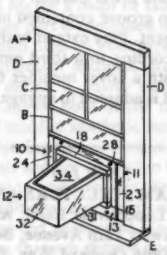
RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR

John P. Francis, 20 Boston Street, Haverhill, Mass.

Continuation-in-part of Ser. No. 18,616, March 11, 1970, Pat. No. 3,593,467. This application June 28, 1971, Ser. No. 157,223

Int. Cl. A47g *7/02*; **A47h** *27/00*

U.S. Cl. 52—29 **11 Claims**



This invention provides for a retractable window case structure or container, in the form of a box-like unit, removably attached and adjustably supported from a laterally adjustable support removably and frictionally engaged within an open window area. The adjustable support is provided with at least one laterally movable end member for frictional supporting engagement within the window frame area. The case structure is fully supported through an opening within the support and the added supporting members, for movement to either outside weather or inside house environment. The device is a protective container for food, birds, plants and the like.

3,698,144

POST ANCHOR

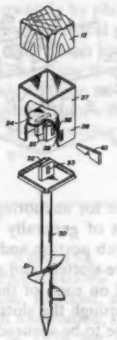
Patrick Joseph Stratton, 30 Sandy Drive, Whitecourt, Alberta, Canada

Continuation-in-part of Ser. No. 863,010, Sept. 24, 1969, abandoned. This application Dec. 3, 1970, Ser. No. 94,935

Int. Cl. E01f *9/01*; **E04c** *3/32*

U.S. Cl. 52—99 **1 Claim**

A detachable post anchor for use with highway marker posts and the like is provided. The anchor comprises two separable elements, more particularly a spike member and a holder. The spike member includes a spike, a horizontal base plate carried by the spike at its upper end, and a slotted lug extending upwardly from the base plate. The holder is tubelike in form and receives the bottom end of the post in its upper end. A pair of spaced, vertical, slotted lugs are fixed within the bottom end of the holder. The slots of the spike and holder lugs line up when the holder is mounted on the base plate. A



shear pin is inserted through the lugs to secure the holder and spike together. When the post is struck from the side, the holder pivots about its bottom edge; the shear pin parts and the post and holder topple over. The anchor can be re-assembled by insertion of a new shear pin.

3,698,145

HOLLOW STRUCTURE WITH CORE OF INTERWOVEN STRIPS

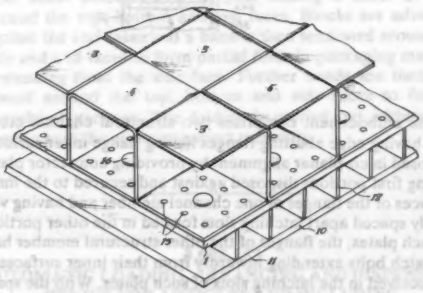
Paul Newman, and Maxwell John Holland, both of Filton, England, assignors to Secretary of State for Defence, London, England

Filed Aug. 3, 1970, Ser. No. 60,601

Claims priority, application Great Britain, Aug. 18, 1969, 41,130/69

Int. Cl. E04b *1/82, 2/14*

U.S. Cl. 52—144 **8 Claims**

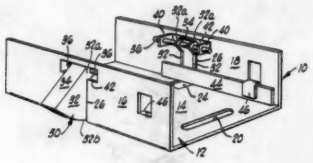


A liner for a wall is made from strips of rigid material bent into a rectangular wave form and woven to form two substantially plane surfaces with chambers in between. The strips are perforated and attached to a backing member either (a) with the perforations facing away from the backing member to act as an acoustic liner, or (b) with the perforations in contact with the backing member and aligned with perforations therein for supply of cooling fluid, so that the structure can be used as an impingement cooled heat shield.

3,698,146
ANCHOR DEVICE FOR DOOR FRAMES

J. W. Brents, 2 Sheffield Drive, Little Rock, Ark.

Filed Nov. 19, 1970, Ser. No. 90,963
Int. Cl. E06b 1/18, 1/60
U.S. Cl. 52—214 8 Claims

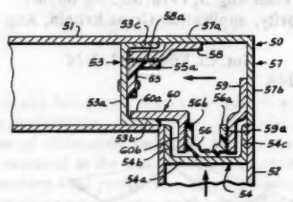


An anchoring device for anchoring door frames which includes a base bracket of generally U-shaped configuration having an apertured web portion and a pair of legs extending therefrom. The legs are slotted, and a pair of retainer latches are pivotally mounted on each of the legs adjacent the slots therein for pivoting through the slots into the path of flanges carried by a door frame to be secured in the opening in a wall by means of the anchor device. The retainer latches are biased through the slots in the legs of the base bracket by means of springs extended along the inside surface of the legs, and bearing against one side of each of the retainer latches.

3,698,147
STRUCTURAL MEMBER CONSTRUCTION FOR BUILDING WALLS

John Sikes, 8535 Findley, Houston, Tex.

Continuation-in-part of Ser. No. 697,672, Jan. 15, 1968, abandoned. This application Dec. 8, 1969, Ser. No. 882,995
Int. Cl. E04b 1/343, 1/30
U.S. Cl. 52—276 4 Claims



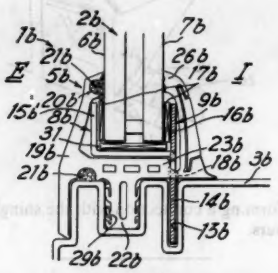
One embodiment comprises two structural channel members having edge abutting flanges having flange inner surfaces disposed in co-planar alignment by providing connector plates having first portions disposed against and secured to the inner surfaces of the flanges of one channel member and having vertically spaced apart latching slots formed in the other portions of such plates, the flanges of the other structural member having latch bolts extending inwardly from their inner surfaces to be received in the latching slots of such plates. With the space between the channel members filled, as with concrete, a strong column is provided to space wall sheaths which are mounted upon the opposite outer flange faces of the channel members.

In another embodiment, the channel members are latched to one another by means of overlapping-U-shaped connectors secured to the channel members intermediate the flanges thereof. The open end of one such connector is sized to fit snugly over the open end of the other connector, the legs of the outer connector being provided with inner ribs which engage outer ribs on the inner connector in an interlocking manner.

3,698,148
PANEL MOUNTING MEANS AND METHOD

Bernard Marantier, 18, Avenue du General Leclerc, 92 Boulogne-sur-Seine, France

Filed Dec. 7, 1970, Ser. No. 95,719
Claims priority, application France, Dec. 8, 1969, 6942402
Int. Cl. E06b 1/68, 3/60, 3/62
U.S. Cl. 52—400 9 Claims

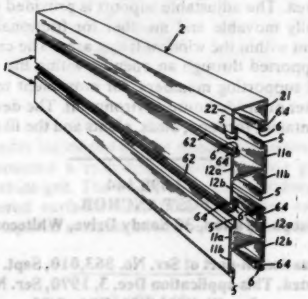


Apparatus for mounting panel means of the mirror or window pane type within an opening contained in a support, characterized by the provision of a plurality of retaining means arranged in spaced relation about the periphery of said panel means, said retaining means being dimensioned to engage only a fraction of the peripheral edge portion of said panel means, in combination with seal means for sealing the entire peripheral space between the exterior face of said panel means and said support. In the preferred embodiment, the retaining means and the lower portion of said seal means extend within a common groove contained in the support, while in a second embodiment, they extend within separate spaced parallel grooves. According to a third embodiment, the seal means are integral with a cover member that also covers the retainer members and is adapted to engage the internal face of the panel means.

3,698,149
COMPOSITE BEAM STRUCTURE AND ASSEMBLY

William Baker, 403 Loudonville Road, Albany, N.Y.; Clyde Worrell, 334 Southwest 12th Avenue, Boynton, and Donald Howard Banzhaf, 5805 Orchard Way, Palm Beach, both of Fla.

Filed Sept. 15, 1969, Ser. No. 9,252
Int. Cl. E04c 2/40, 3/04
U.S. Cl. 52—731 26 Claims



A composite beam structure is provided for the construction of walls, roofs, partitions, and other structural supporting assemblies. The beam structure utilizes side-to-side modular double-walled beams, interlocking along two edges on each side, and attached together.

A high strength, lightweight composite structure is provided

requiring no additional structural support members to secure each beam to an adjacent beam or to support the composite structure. The composite beam structure can be disassembled without destroying the beams and later reassembled at another location.

3,698,150

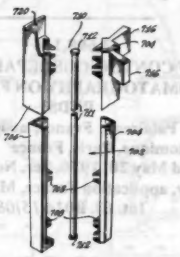
BIPARTITE TUBULAR MOLDED SYNTHETIC RESIN FURNITURE PART WITH INTERNAL REINFORCEMENT

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 797,616, Feb. 7, 1969, abandoned. This application June 4, 1970, Ser. No. 43,521

Int. Cl. E04c *3/00, 2/30*

U.S. Cl. 52—731 **4 Claims**



A bipartite generally tubular molded synthetic resin furniture part, such as a leg for a chair or table or a chair back assembly. The furniture part is composed of two complementary molded synthetic resin tube sections arranged side by side and having mating longitudinal marginal portions bonded to one another so as to define a cavity extending longitudinally through the part. One or both of the tube sections are provided with integral molded synthetic resin reinforcing formations, such as reinforcing ribs or flanges, which extend across the cavity at intervals and are bonded to the opposite tube section in such a way as to reinforce the part against deformation under the load. Additional reinforcement of the part may be provided by a metal rod positioned longitudinally within the cavity and extending through aligned openings in the reinforcing ribs.

3,698,151

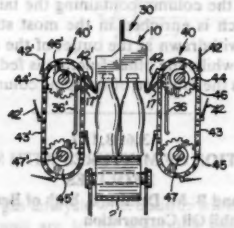
METHOD AND APPARATUS FOR PACKAGING BOTTLED PRODUCTS IN BASKET-STYLE CARRIERS

Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Sept. 8, 1970, Ser. No. 70,435

Int. Cl. B65b *21/22, 5/06*

U.S. Cl. 53—26 **18 Claims**



A method and apparatus for continuous packaging of bottled beverages, or the like, in basket-style carriers wherein the carriers are advanced by an overhead conveyor, in opened-up condition with bottom wall forming flaps, which initially depend in the plane of the side walls being hinged to an upwardly inclined position while the carriers travel down an inclined path, for assembly with groups of the bottled beverages which are advanced on a bottom conveyor to an assembly area where successive carriers are forced in telescoping relation down over groups of bottles and the bottom wall forming panels of the carriers which have been hinged upwardly are engaged and drawn downwardly by plate members carried on endless conveyors traveling in vertical paths on opposite sides of the groups of bottles, after which heat activatable adhesive on the bottom wall forming flaps is activated and the flaps which have been swung down upon advance beyond the draw down plates are plowed into bottom wall forming position with overlapping margins in seam forming engagement so as to complete the packages.

3,698,152

PACKAGING

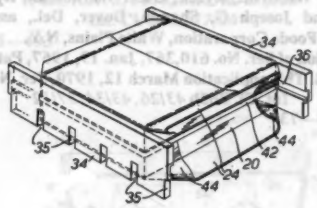
Geoffrey R. Reed, London, England, assignor to The British Iron and Steel Research Association, London, England

Filed March 24, 1970, Ser. No. 22,189

Claims priority, application Great Britain, April 11, 1969, 18,766/69

Int. Cl. B65b *25/14, 27/08*

U.S. Cl. 53—27 **7 Claims**



A rectangular pile of steel sheets is packaged in a single steel sheet automatically by first folding a sheet of steel around the top, bottom and end faces. Blocks are advanced against the end faces and a band is then tensioned around the side and end faces to form partial folds in packaging material protruding from the side face. Further bands are then tensioned around the top, bottom and side faces to form a completed package. The folding is carried out without the need to beat the packaging sheet manually.

3,698,153

AUTOMATIC LOADING, ARRANGING AND DISPENSING DEVICE FOR ARTICLES AND INCLUDING CONTAINERS, POUCHES AND THE LIKE

Abraham Buddy Lieberman, St. Leonard, Canada, assignor to Glolok Co., Ltd., St. Leonard, Montreal, Canada

Filed Oct. 6, 1969, Ser. No. 863,823

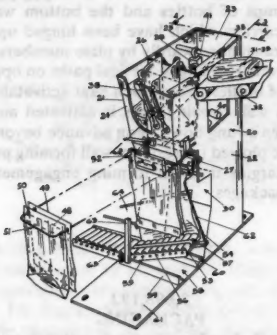
Claims priority, application Canada, Sept. 25, 1969, 63105

Int. Cl. B65b *57/10, 35/30*

U.S. Cl. 53—61 **14 Claims**

The invention refers to an automatic loading, arranging and dispensing device for articles and including containers, pouches and the like, in which the device has an article loading and arranging section provided with a plurality of self-guiding and aligning walls which are adapted to receive the ar-

ticles individually and to be actuated thereby for guiding and collating the articles in vertical and aligned positions in the



loading and arranging section and to dispense the same therefrom by automatically dropping them, as a unit, vertically into an outer bag or other closures.

3,698,154

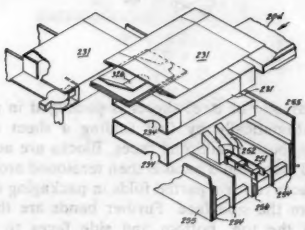
PACKAGING APPARATUS AND PROCESS

George M. Woodruff, Nyack; Oscar W. Stoeckli, Rye, both of N.Y., and Joseph G. Shando, Dover, Del., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 610,367, Jan. 19, 1967, Pat. No. 3,513,618. This application March 12, 1970, Ser. No. 26,484

Int. Cl. B65b *43/26, 43/34, 57/12*

U.S. Cl. 53—73 **12 Claims**



A cartoning mechanism includes a magazine for retaining a stack of cartons in flattened condition and a reciprocally driven blade operative for penetrating the lowermost carton of the stack to open said carton and advance it in opened condition to a loading station.

3,698,155

BAG SUPPORT ASSEMBLY

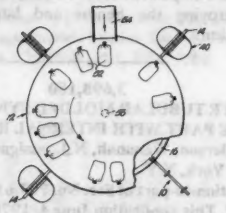
Allan B. Robinson, Overland Park, Kans., assignor to Mobil Oil Corporation

Filed April 8, 1971, Ser. No. 132,298

Int. Cl. B65b *67/12*

U.S. Cl. 53—390 **7 Claims**

A bag support assembly for use in connection with packaging equipment wherein is provided a laterally extending member projecting outwardly in a horizontal plane from a table intended to receive smaller packages, the member having a plurality of L-shaped arms thereon, provided with protective rubber sleeves, which arms receive the upper marginal edge of one sidewall of a larger bag within which the smaller



packages are to be deposited, the user of the device supporting the opposite sidewall of the bag whereby to present an open top for the bag.

3,698,156

METHOD OF CONTINUOUS SEPARATION BY GAS-PHASE CHROMATOGRAPHY ON FIXED GRANULAR REDS

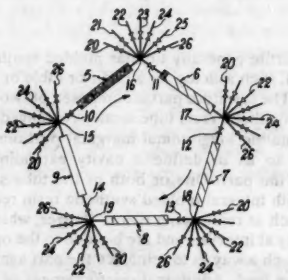
Gregoire Dirian, Palaiseau, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed May 20, 1970, Ser. No. 39,091

Claims priority, application France, May 22, 1969, 6916709

Int. Cl. B01d *15/08*

U.S. Cl. 55—67 **12 Claims**



At least four columns filled with granular material are arranged so as to form a circulation loop, each column being intended to perform in cyclic operation successive functions of stripping, enriching, collecting the tail gas which is enriched in the least strongly adsorbed component of a gas mixture and feeding of the tail gas which is enriched in the most strongly adsorbed component. The mixture to be separated is introduced at a point of the pipe which connects the column employed at a given moment as stripping column to the column which serves at the same moment as enriching column. A fraction of the gas which is enriched in the least strongly adsorbed component is recovered at the outlet of the enriching column whilst the other fraction is fed into the following column. The gases which are adsorbed on the granular material are desorbed from the column containing the tail gas. A fraction of the gas which is enriched in the most strongly adsorbed component is withdrawn at the outlet of the column containing the tail gas whilst the other fraction is fed into the column which performs the function of stripping column.

3,698,157

SEPARATION OF MIXTURES WITH MODIFIED ZEOLITES

Paul T. Allen, and B. M. Drinkard, both of Beaumont, Tex., assignors to Mobil Oil Corporation

Filed June 1, 1971, Ser. No. 149,050

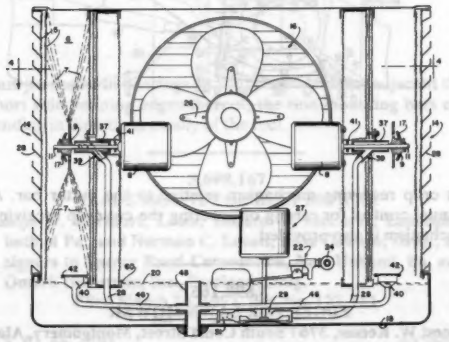
Int. Cl. B01d *15/08;* **C07c** *7/12*

U.S. Cl. 55—67 **24 Claims**

An improved method for separation and isolation of individual components contained in a C_8 aromatic mixture such

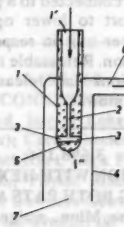
as p-xylene and ethylbenzene, by contacting the mixture with an aluminosilicate zeolite which has been contacted with an organic-radical substituted silane to modify the characteristics of the zeolite.

3,698,158
AIR RECONDITIONING APPARATUS
John E. Kinnebrew, 1311 North 31st, Phoenix, Ariz.
Filed Feb. 24, 1971, Ser. No. 118,367
Int. Cl. B01d *50/00*
U.S. Cl. 55—227 **7 Claims**



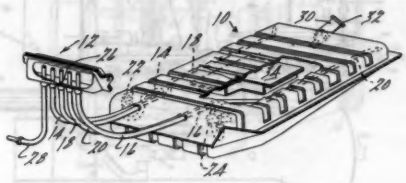
In an air reconditioning apparatus including a casing having inlet and outlet openings, a fan is mounted adjacent the outlet opening for drawing air to be reconditioned into the inlet opening through a plurality of expanded metal impingement screens, a power-operated dual action centrifugal atomizer is provided adjacent the inlets for supplying scrubbing water to the incoming air and a dehumidifying means is provided between the atomizer and the outlet fan.

3,698,159
GAS ANALYZER AND MIST SEPARATOR
Alois Ruse, Stierstadt (Taunus), Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Sept. 11, 1968, Ser. No. 759,134
Int. Cl. B01d *47/00*
U.S. Cl. 55—257 **1 Claim**



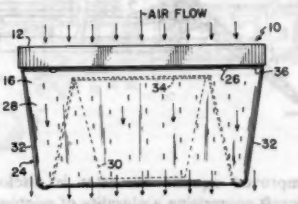
A device for gas analysis where sulfur trioxide mist droplets are entrained and are to be separated from a sample gas stream before the gas enters an analyzer. Entrained droplets are removed by passing the gaseous suspension through an entrance capillary and thence out through exit capillaries at right angles thereto and at the end thereof after coalescence of the droplets.

3,698,160
MOTOR VEHICLE FUEL TANK VENTING
William A. Hunter, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed July 16, 1970, Ser. No. 55,543
Int. Cl. B01d *45/06*; B65d *25/00*
U.S. Cl. 55—385 **4 Claims**



Positionally responsive valves mounted in a motor vehicle fuel tank and connected into part of the tank evaporative control vent system to aid in the separation of liquid fuel from vapor fuel in the vent system.

3,698,161
FILTER
Jacob K. Brixius, Parma; Lawrence M. Takacs, Solon, and James P. Van Sweringen, Cleveland Heights, all of Ohio, assignors to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Nov. 3, 1970, Ser. No. 87,366
Int. Cl. B01d *27/06*
U.S. Cl. 55—493 **2 Claims**

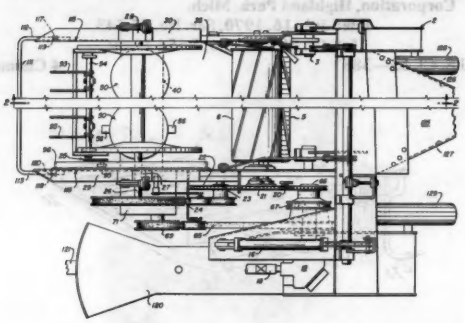


A filter for removing impurities from an airstream comprising a housing having filter media holding means operatively attached thereto and a flange portion disposed around said housing, a filter media retainer fixedly attached to said housing, filter media attached in an airtight manner on said flange portion by said holding means, said retainer retaining said media in such a position with respect to the airstream that said filter media forms two coaxial filter pockets of substantially equal depth, thereby optimizing the impurity-removing properties of said filter media.

3,698,162
CROP HARVESTING MACHINE
Thomas J. Scarnato, Barrington, and Martin H. Meyer, Elburn, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed April 23, 1970, Ser. No. 31,110
Int. Cl. A01d *43/00*
U.S. Cl. 56—1 **9 Claims**

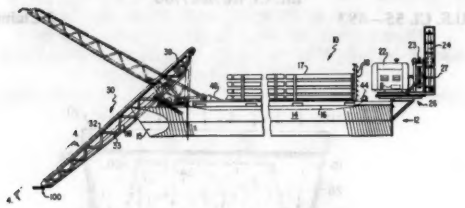
A harvesting device comprising a platform with rotary mowing devices along its forward edge arranged to sling the material upwardly and rearwardly onto an upwardly and rearwardly sloping platform for delivery of the crops to a pair of conditioning rollers, and a reel cooperating with the mowing

devices which functions to feed the material prior to cutting into the mowing devices and after the material is cut sweeping



the cut material off the mowing devices and controlling the flow of the material into the hay conditioning rollers.

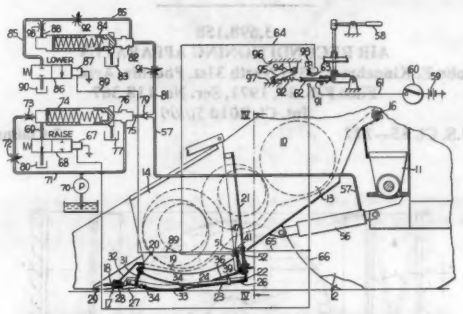
3,698,163
AQUATIC HARVESTER
Thomas G. Kelpin, 8877 Boyonne Drive, Shreveport, La.
Filed Dec. 14, 1970, Ser. No. 97,497
Int. Cl. A01d *45/08*
U.S. Cl. 56—9 **26 Claims**



An improved aquatic harvester is disclosed having an aquatic craft comprising a plurality of pontoons secured to a flat deck member, the craft being propelled and steered by a totally above-the-water air propulsion system. Other features include a self-unloading conveyor system, a heavy duty cutter bar assembly specially designed for cutting underwater weed growth, and a three-phase electrical power system to operate all subassemblies. The harvester is capable of carrying payloads in excess of 10 tons while at the same time having a draft of approximately 15 inches of water with no below-the-water drive or controls, thus rendering the craft free from fouling.

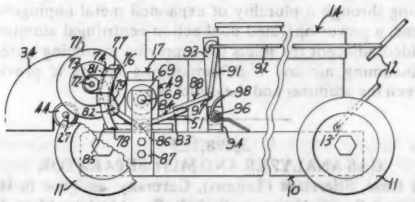
3,698,164
AUTOMATIC HEADER HEIGHT CONTROL SENSED FROM FLOATING CROP ENGAGING MECHANISM
Jerry C. Boone, and Lawrence E. Allen, both of Independence, Mo., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed July 9, 1970, Ser. No. 53,444
Int. Cl. A01d *67/00*
U.S. Cl. 56—10.4 **11 Claims**

A combined electrical, mechanical and hydraulic mechanism in a combine harvester wherein the cutter bar rides on the ground and is mounted on the forward end of a frame member having its rear end pivotally attached to a cut crop receiving mechanism on the harvester. A feeler member mounted on the cut crop receiving mechanism contacts the frame member for actuating a control to raise or lower the cut crop receiving mechanism for maintaining the position of the



cut crop receiving mechanism relative to the cutter bar. A manual control for raising or lowering the cut crop receiving mechanism is also provided.

3,698,165
EDGER FOR LAWN MOWER
Ernest W. Keesee, 3767 South Court Street, Montgomery, Ala.
Filed March 3, 1971, Ser. No. 120,552
Int. Cl. A01d *35/26*
U.S. Cl. 56—11.4 **2 Claims**

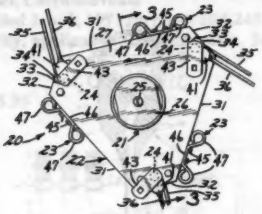


An edger support is mounted on a mower housing for pivotal movement selectively to an upper inoperative position to a lower operative position. An edger blade is carried by the support and operatively connected to a power unit in response to movement of support to lower operative position and disconnected from power unit in response to movement to upper inoperative position. Releasable means holds edger support in selected positions and releasable means connects power unit to wheels of mower.

3,698,166
REEL CONSTRUCTION WITH HEXAGONAL SPIDERS FOR MOUNTING BOTH BATS AND TINE BARS
Ivan E. Fisher, Owatonna, Minn., assignor to Owatonna Manufacturing Company, Owatonna, Minn.
Filed June 2, 1971, Ser. No. 149,195
Int. Cl. A01d *57/00*
U.S. Cl. 56—220 **2 Claims**

A feeding reel including an axial tubular body and a plurality of axially spaced spider elements rigidly mounted thereon, these spider elements defining hexagons having alternate sides of equal relatively long length and alternating sides of equal relatively short length, flanges projecting in directions axially

of the reel and defining the relative long side of the hexagons, elongated reel bats mounted on the flanges, and tine mounting



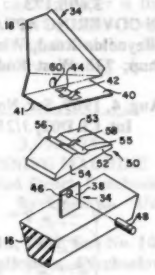
bars journaled in bearings on the spider elements adjacent the short side defining edges thereof, the tine mounting bars extending in directions axially of the reel.

3,698,167

BLADE MOUNT FOR BELT MOWER

Joseph C. Hurlburt, Leola; Horace G. McCarty, Lancaster, both of Pa., and Norman C. Locati, Lake Oswego, Oreg., assignors to Sperry Rand Corporation, New Holland, Pa. and Omark Industries, Inc., Portland, Oreg.

Filed March 23, 1971, Ser. No. 127,111
Int. Cl. A01d *55/24*
U.S. Cl. 56—291 6 Claims



An endless belt type cutter assembly for a mower having cutter blades of the impact type fixed at spaced intervals and projecting outwardly from one edge of the belt, the blades being connected to the belt by means permitting limited yieldability.

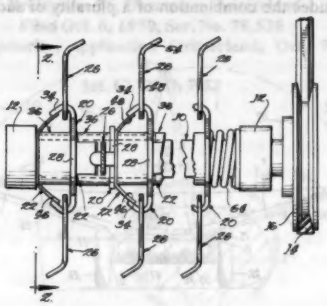
3,698,168

BLADE CONNECTING MEANS

Carl W. Mott, deceased, late of Lake Ozark, Mo. (by Elsie Viola Mott, executrix); Carl Wheeler Mott, Jr., La Grange Park, Ill.; Elnora Mott Hart, Rock Falls, Ill.; Dorothy Mott Battles, De Kalb, Ill.; Phyllis Mott Halgren, and Elmer Samuel Mott, both of Downers Grove, Ill. (heirs), assignors to Mott Corporation, La Grange, Ill.

Filed July 6, 1971, Ser. No. 160,010
Int. Cl. A01d *55/22*
U.S. Cl. 56—294 14 Claims

Blade connecting means comprises a lug member and a retaining member. The lug member and retaining member are adapted to be secured to a mower shaft and to removably secure a mower blade to the mower shaft. The lug member has at least on one end a hook on which the blade is hung, and the retaining member normally engages and closes the hook of the lug member to retain the blade on the hook and, hence, on the shaft. The blade may be easily installed on or removed from



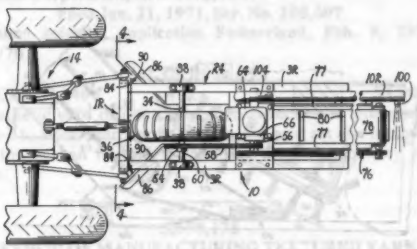
the shaft by manipulating the blade to move the retaining member to a position where the hook is open, no tools being necessary to install or remove the blade.

3,698,169

GATHERING APPARATUS

Lee S. Simpson, 440 North Cornelia, Fresno, Calif.

Filed Feb. 3, 1971, Ser. No. 112,312
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 9 Claims



A gathering apparatus particularly suited for use in harvesting nuts and similar discrete articles. The apparatus is characterized by a pair of converging wings horizontally extended to scrape the surface of the ground to form a window of articles being gathered and a driven impeller having a circular periphery supported to receive the articles in operative engagement, for ejecting the articles from the windrow along an upwardly directed trajectory to an inclined conveyor having a discharge opening disposed above a portable article-receiving bin, whereby randomly deposited articles, such as nuts deposited beneath parent trees, can readily be gathered and rapidly delivered into an article-receiving bin.

3,698,170

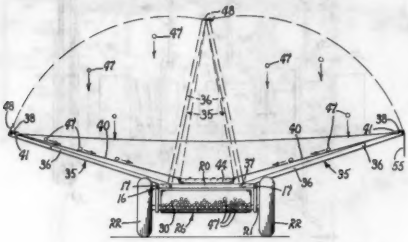
CATCHER FOR FRUITS, NUTS, AND THE LIKE

Joseph F. Kenrick, 734 East Fairmont, Fresno, Calif.

Filed May 19, 1971, Ser. No. 144,760
Int. Cl. A01g *19/06*
U.S. Cl. 56—329 11 Claims

A catcher for fruits, nuts, and the like including a mobile vehicle, a hopper, means mounting the hopper on the vehicle for slidable movement between a predetermined catching position and a position spaced transversely of the vehicle from the catching position and at which the hopper is removable from said means, a frame mounted in the vehicle defining an opening above the hopper when the hopper is in catching position, a pair of wings connected to opposite sides of the frame

pivotal between catching positions oppositely upwardly inclined from the frame and retracted positions pivoted upwardly substantially vertically over the frame. The invention also includes the combination of a plurality of such catchers



pivotally connected in following relation and with the wings forwardly and rearwardly overlapped in vertically spaced relation when in catching positions to avoid interference during relative pivotal movement of the catchers while forming a continuous catching surface.

3,698,171

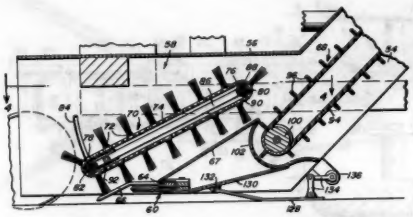
MECHANICAL PICKER FOR STRAWBERRIES

Charles L. Hecht, Route 2, P. O. Box 237, Scio, Oreg.

Filed Aug. 31, 1970, Ser. No. 68,336

Int. Cl. A01g *19/00*

U.S. Cl. 56—331 **24 Claims**



A self-propelled strawberry harvester including a series of picking fingers which move along close to the ground so as to engage under and lift the berry clusters for a severing thereof from the plant by a sickle bar. A leafer belt moves the clusters rearwardly up onto and along the fingers to the sickle bar and upwardly therefrom onto an upwardly and rearwardly inclined conveyor elevator which in turn discharges the severed clusters onto a foraminous belt for movement through a cleaning unit consisting of an underlying blower fan and an overlying suction fan. The cleaned clusters are subsequently discharged into a collection box or container. The height of the picking head is vertically adjustable in response to variations in ground level. The sickle utilizes elongated narrow knives and ledger plates on equal spacing with the picking fingers.

3,698,172

CROP ENGAGING TINE MEANS

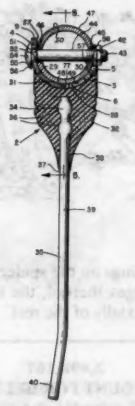
Edward J. Johnston, La Grange, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,284

Int. Cl. A01d *77/00*

U.S. Cl. 56—400 **7 Claims**

A crop-engaging tine assembly comprising a U-shaped clip having an upwardly projecting lug on its front portion and a pair of upwardly projecting bendable ears on the rear portion. The lug has a hole therein for a bolt which extends through aligned openings in a support bar. The headed or nut end of the bolt assembly engages the external side of the lug and the other end of the bolt assembly engages the bar and nests between the ears which embrace the bar with the lug to



prevent turning. A method of fabricating the clip by cutting with a single shear the lug of the front portion of one lug and the notch in the rear portion of the next clip to form the ears so that there is no waste of material and a single cut accomplishes both.

3,698,173

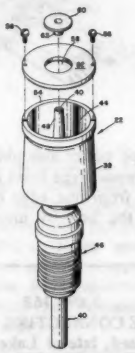
YARN COVERING APPARATUS

Robert Peel, 1502 Reynolda Road, Winston-Salem, N.C., and Francis B. Northup, 725 West End Boulevard, Winston-Salem, N.C.

Filed Aug. 4, 1969, Ser. No. 847,072

Int. Cl. D02j *3/28*

U.S. Cl. 57—18 **14 Claims**



Apparatus used in conjunction with machinery operating at high speeds for wrapping elastomeric thread with a cover yarn, including a spindle and a concentrically mounted housing on the spindle having a interior chamber suitable for receiving one or more self-supporting yarn packages. Yarn is fed from the packages held within the chamber through an opening therein and dispensed, as the spindle and housing rotate at high speed, about the elastomeric thread passing through a longitudinal passage in the spindle. The apparatus contains various means for regulating the behavior of the cover yarn as it is dispensed from the chamber and is wrapped about the elastomeric thread.

3,698,174

SPINNING MACHINE AND METHOD OF OPERATING THE SAME

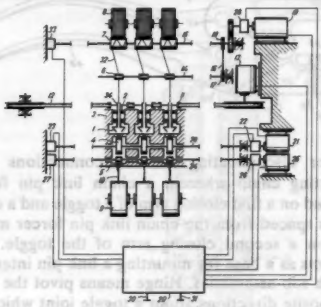
Miroslav Boucek, and Miroslav Jiskra, both of Usti Nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Jan. 6, 1971, Ser. No. 104,245

Claims priority, application Czechoslovakia, Jan. 19, 1970, 36770

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.95 6 Claims



A spinning machine and a method of operating it. The spinning machine has one or more rotary spinning chambers each of which receives fibrous sliver from a rotary carding and feed roller, spins it into a yarn and has the yarn withdrawn by a withdrawing device. To stop the operation of the machine, the drive of the feed and carding roller is first terminated and simultaneously positive braking action is applied to the roller. Thereupon the withdrawing device has its drive terminated and only then is the rotary spinning chamber disconnected from its own drive.

3,698,175

SPINNING MACHINE

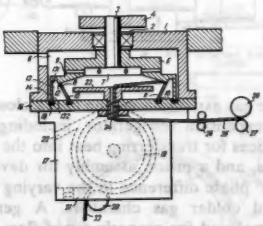
Jaroslav Dykast, Usti Nad Orlici, Czechoslovakia, assignor to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Jan. 18, 1971, Ser. No. 107,362

Claims priority, application Czechoslovakia, March 27, 1970, 205070

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 10 Claims



A rotary spinning chamber is rotatable about a predetermined axis and has an open side. A peripheral wall of the rotary spinning chamber has an inner circumferential fiber-collecting surface which extends inwardly from the open side and surrounds the axis of rotation. Outlet apertures are provided in the peripheral wall extending from the surface to the outer side of the wall, and wall means defines a closed compartment adjacent the outer side and communicating with these apertures.

3,698,176

SPINNING RING FOR RING SPINNING AND RING TWISTING FRAMES

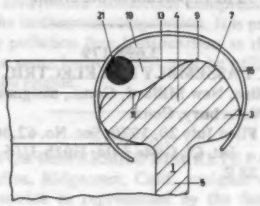
Ernst Kunz, Breitigasse 26, Oberuster, Switzerland

Filed Oct. 6, 1970, Ser. No. 78,526

Claims priority, application Switzerland, Oct. 7, 1969, 15037/69

Int. Cl. D01h *7/52*

U.S. Cl. 57—119 9 Claims



A spinning ring for spinning of roving into yarn is provided with a generally T-shaped cross-section with the upper flange of the T having a convex contour at the outer periphery of the ring and a concave or straight contour of the flange top inside the convex portion.

3,698,177

TEXTURIZING YARN, PROCESS AND PRODUCT

Franz Nyfeler, Kaltbrunn, Switzerland, assignor to Heberlein Patent Corporation, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,607

Claims priority, application Switzerland, Feb. 9, 1970, 1805/70

Int. Cl. D02g *1/02*

U.S. Cl. 57—140 J 5 Claims

Synthetic yarn of non-circular cross-section is temporarily twisted to a less than normal extent and heat set at a temperature lower than normal to maintain original geometry and lustre.

3,698,178

METHOD OF MANUFACTURING TEXTURED YARN HAVING TRASVERSE DEFORMITIES

Mutsuo Iwaoka, Yasu-gun; Akio Takegawa, Kusatsu; Hiraku Inoue; Katsusuke Egami, both of Otsu; Kouiti Nishikura, Kusatsu; Shigeji Yamashita, Koga-gun, and Tadahiro Nagayasu, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 29, 1970, Ser. No. 59,065

Claims priority, application Japan, Aug. 25, 1969, 44/67299; Feb. 2, 1970, 45/85961

Int. Cl. D02h *1/02, 1/20*

U.S. Cl. 57—157 TS 10 Claims

A method of manufacturing textured yarn comprises providing a crimped yarn composed of numerous crimped and entangled together thermoplastic synthetic fibers, partially

removing some of the crimp from the crimped yarn, heating and pressing together the resulting partially crimped yarn to contact the fibers at their mutually intercrossed locations with sufficient pressure and at a sufficient temperature to effect permanent transverse deformation of the fibers at their contact points, and terminating the heating and pressing to obtain a textured yarn composed of numerous fibers having longitudinally and randomly spaced transverse deformities. The yarn is initially crimped by false twisting and steam setting, and some of the crimp is removed from the crimped yarn to remove from 75 to 95 percent of the crimp.

3,698,179

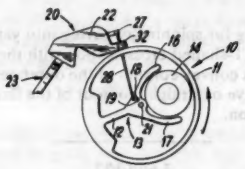
CONTACT ASSEMBLY FOR ELECTRIC WATCHES

Edward Kaulins, New Milford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed July 20, 1970, Ser. No. 62,302

Int. Cl. G04c 3/04; H01h 3/16

U.S. Cl. 58—28 R **6 Claims**



A contact spring assembly for an electric watch comprises an elongated contact spring which intermittently engages a contact pin on the balance wheel. The contact spring is fixedly mounted at one end to a base member and damped to eliminate undesirable oscillations by positioning a spring portion located a predetermined distance from the end in a slotted member. The spring portion in the slot is surrounded by a material which dampens the vibrations of the spring as the free end contacts the pin during the oscillations of the balance wheel.

3,698,180

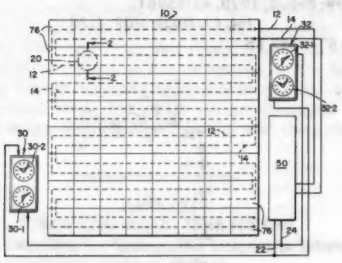
AUTOMATIC CHESS TIME INDICATOR

Emil Klein, New York, N.Y., assignor to Samuel F. Kinnroth, New York, N.Y., a part interest

Continuation-in-part of Ser. No. 804,118, March 4, 1969, abandoned. This application Aug. 6, 1971, Ser. No. 169,718

Int. Cl. G04f 3/00; A63f 3/02, 9/00

U.S. Cl. 58—145 D **10 Claims**



An automatic time indicator for use during a chess match. A control circuit is provided to alternately control the running of respective players' time clocks without any direct manual intervention, relying on circuitry in the chess board itself and the placement of a chess piece on a new square by any player.

3,698,181

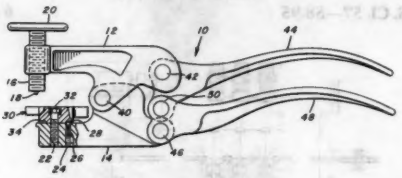
ROLLER CHAIN DISCONNECTOR APPARATUS

William T. Paul, Holyoke, and Wayne R. Tracy, Willimansett, both of Mass., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1970, Ser. No. 85,059

Int. Cl. B21l 21/00

U.S. Cl. 59—11 **4 Claims**



Apparatus for disconnecting the interconnections of a power transmitting chain wherein a chain link pin forcer means is mounted on a first closing arm of a toggle and a chain holder means is spaced from the chain link pin forcer means and mounted on a second closing arm of the toggle. The holder means acts as a base for mounting a link pin interconnecting two link sub-assemblies. Hinge means pivot the closing arms in opposite directions about a toggle joint which interconnects the closing arms, thereby applying a multiplied closing force to the link pin force means and thereby forcing the link pin free of the sub-assemblies.

3,698,182

METHOD AND DEVICE FOR HOT GAS ENGINE OR GAS REFRIGERATION MACHINE

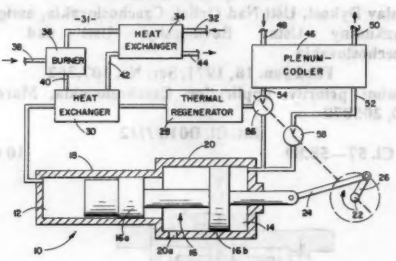
Stellan Knoos, Fregattvagen 2, Taby, Sweden

Filed Feb. 16, 1971, Ser. No. 115,547

Claims priority, application Sweden, March 2, 1970, 12640/70

Int. Cl. F01k 7/06

U.S. Cl. 60—24 **35 Claims**



A closed-cycle gas expansion engine and a closed-cycle or open-cycle gas expansion refrigerator, including a thermal regenerator, devices for transferring heat into the gas or subtracting cold gas, and a piston assembly for developing approximately 180° phase difference in the varying volumes of the warmer and colder gas chambers. A general valve mechanism is employed for properly timed flow of working gas into the primary gas chamber from a plenum chamber containing cooling devices for closed-cycle operation, or for flow of working gas into the primary gas chamber from an ambient atmosphere for open-cycle operation. A valve mechanism, separate or coupled to the first mechanism, is used for proper initiation and termination of gas flow between the primary and secondary chambers in one particular phase of the reciprocating piston motion. Still another valve, which may be integrated with any of the other mentioned valve mechanisms, is used for release of suitably recompressed

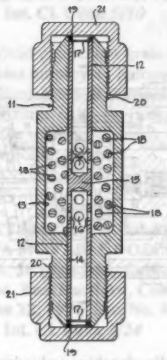
working gas in the secondary chamber into the plenum chamber with a closed cycle, or for properly timed exhaust of such gas back to the ambient atmosphere with an open cycle.

3,698,183

INITIATOR BOOSTER

Hugh D. MacDonald, Cinnaminson, N.J., and Eugene J. Doebley, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed June 1, 1971, Ser. No. 148,563
Int. Cl. F01b *31/00, 9/100*
U.S. Cl. 60—26.1 **2 Claims**



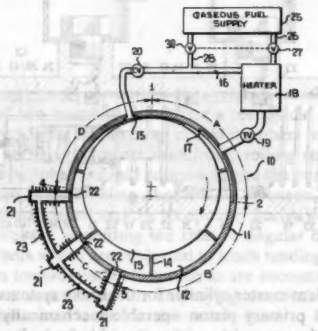
A miniature initiator booster for an energy transmission system having a minimum of size, weight and production cost. It includes a unitary body with a longitudinal passage defined by an internal cylindrical wall at the body ends and an intermediate enlarged annulus substantially filled with propellant pellets that surround predetermined small apertures in the sidewall of a hot gas transmitting flash tube. The central portion of the flash tube is blocked with an integral transverse wall to direct the inlet hot gas into the propellant containing annulus for ignition of the booster propellant and release of the booster gas through the sidewall apertures in a manner to satisfy the system requirements.

3,698,184

LOW POLLUTION HEAT ENGINE

George M. Barrett, R.R. #5, Galt, Ontario, Canada

Filed Nov. 4, 1970, Ser. No. 86,738
Int. Cl. F01k *25/00*
U.S. Cl. 60—36 **9 Claims**



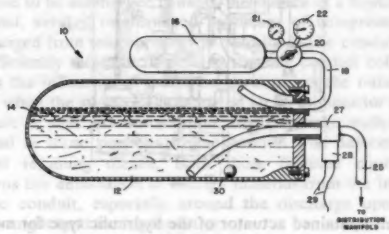
This disclosure relates to a heat engine which operates generally on the basis of the Carnot cycle and includes a rotor mounted within a chamber and sealed relative to the chamber by means of a plurality of radiating vanes. Gas compressed in the mechanical compression cycle of the engine is by-passed to the part of the invention wherein isothermal expansion normally occurs in the Carnot cycle, and these compressed gases are heated to supply greater energy thereto to produce a greater energy working in both the isothermal expansion phase and the reversible adiabatic expansion phase and the reversible adiabatic expansion phase of the cycle. In addition, external flow passages are connected to the chamber of the engine in the area where isothermal compression occurs for accelerating the isothermal compression. It is proposed to use a substantially pollution free hydrocarbon as the fuel for the heater, and the same hydrocarbon may be utilized as the gas sealed within the engine.

3,698,185

METHOD FOR DISPERSING DISCRETE PARTICLES

John D. Crecelius, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 1, 1969, Ser. No. 866,072
Int. Cl. F02g *9/00*
U.S. Cl. 60—39.02 **4 Claims**



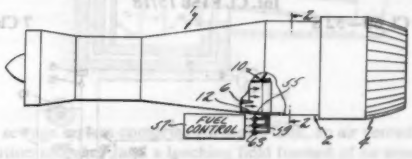
A slurry of metal flakes and freon is carried in a pressure tank connected to a supply tank of pressurized gas and to a distribution manifold attached near the exhaust pipe of a vehicle. When the slurry is released, the metal flakes are dispensed into the area surrounding heat radiating portions of the vehicle.

3,698,186

AFTERBURNER COMBUSTION APPARATUS

David J. Beane, North Palm Beach, Fla., and John H. Gastler, Portland, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 24, 1970, Ser. No. 101,225
Int. Cl. F02k *3/10*
U.S. Cl. 60—39.72 R **15 Claims**



A power plant with an afterburner has a combustion apparatus therein which comprises a flameholder-spraybars extending radially into the afterburner at a plurality of locations. A third of the flameholder-spraybars are full length and extend to a center body, a third are of medium length and extend to the center of a hot exhaust, and a third are short and extend inwardly to a point rearwardly of a splitter separating the hot exhaust from a cooler fan duct air. The medium length

flameholder-spraybars are divided into two fuel injection compartments and the full length flameholder-spraybars are divided into three fuel injection compartments. For primary zone burning fuel is admitted to the innermost compartment of each of the full length flameholder-spraybars; for secondary zone burning, the inner compartments of the medium length flameholder-spraybars and the middle compartments of the full length flameholder-spraybars then also have fuel directed thereto; and for tertiary zone burning, fuel is then also directed to the outermost compartment of each of the full length and medium length flameholder-spraybars and to the short length flameholder-spraybars.

3,698,187

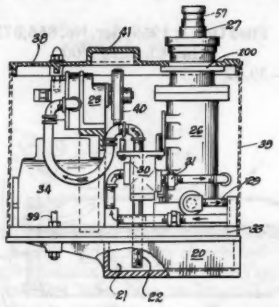
ACTUATOR

Henry H. Logan, 6107 North Newbury Avenue, Chicago, Ill.

Filed Jan. 28, 1971, Ser. No. 110,509

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 US **5 Claims**



A self-contained actuator of the hydraulic type for moving loads of a magnitude and for distances not practical for electric solenoids. A fluid reservoir, an electric motor, a pump and a hydraulic cylinder are mounted on a common base to comprise a compact unit, together with a belt drive connecting the motor and pump, a check valve to hold the liquid in the cylinder, a solenoid-operated return valve to drain the cylinder and a metering valve to control the rate of flow out of the cylinder. A remote, manually controlled switch device is designed to energize the motor and the solenoid in a mutually exclusive manner, the switch device having a neutral position and a spring-operated cam for normally urging the switch device to its neutral position.

3,698,188

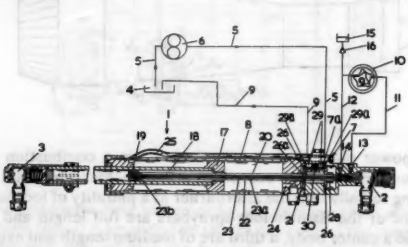
POWER-ASSISTED STEERING MECHANISMS FOR MOTOR VEHICLES

Leslie Richard Jenvey, Reading, England, assignor to Adwest Engineering Limited, Reading, Berkshire, England

Filed Dec. 18, 1970, Ser. No. 99,460

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 S **7 Claims**



Power-assisted steering mechanism for a motor vehicle comprising a double-acting power-assist piston and cylinder means, a valve having a member movable to connect one side or the other of the power-assist piston and cylinder means with a source of fluid under pressure, and control means for controlling the movement of the movable valve member, the control means comprising a closed hydrostatic circuit which includes at least one positive displacement pump motor adapted for actuation by a manual steering control.

3,698,189

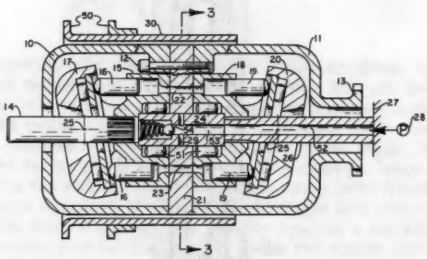
NEUTRAL CONTROL FOR HYDRAULIC TRANSMISSION

Leonard H. Reimer, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed April 9, 1971, Ser. No. 132,797

Int. Cl. F16h *39/10*

U.S. Cl. 60—53 A **12 Claims**



A neutral hydraulic clutching valve incorporated within the valve disc of a hydromechanical transmission. An actuating stem on the valve poppet extends outwardly of the valve disc to be actuated by a cam surface on the transmission control sleeve upon movement of the control sleeve to the neutral position. A neutral valve intercepts each valve slot of the closed loop and relieves pressure therein when actuated.

3,698,190

TANDEM MASTER CYLINDER

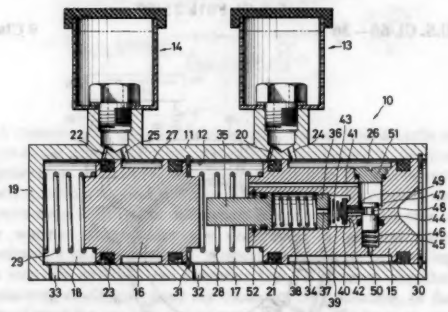
Masaya Miyai, Toyota, Japan, assignor to Aisin Seiki Kabushiki, Kariya, Kariya Aichi Pref., Japan

Filed March 15, 1971, Ser. No. 124,258

Claims priority, application Japan, March 25, 1970, 45/24624

Int. Cl. F15b *7/00*

U.S. Cl. 60—54.6 E **16 Claims**



A tandem master cylinder for the brake systems of the vehicle has a primary piston operable mechanically by a brake pedal and a secondary piston operable by hydraulic pressure generated by the primary piston. At least one of the primary and secondary pistons comprises a fluid storage chamber to normally store the brake fluid therein, a fluid locking piston

urged to move within the storage chamber by the other piston or end wall of the cylinder, and a valve means for controlling fluid communication to the storage chamber in response to brake fluid pressure. When no hydraulic pressure is generated in one of the brake systems associated with the storage chamber, the locking piston and the valve means will cooperate to lock the fluid in the storage chamber thereby minimizing brake pedal travel loss.

3,698,191

NONSUSTAINING HYBRID PROPELLANT GRAIN

Robert W. Ebeling, Jr., Kutztown, Pa., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 1, 1967, Ser. No. 660,869
Int. Cl. C06d *5/10*
U.S. Cl. 60—220 **6 Claims**

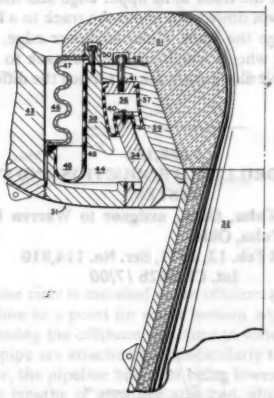
A nonsustaining hybrid propellant grain is provided for use in hybrid rocket systems employing halogen and interhalogen oxidizers. The propellant grain comprises an organic binder and a nitrate oxidizing salt in amounts substantially stoichiometric with the carbon content of the grain. The preferred nitrate is ammonium nitrate.

3,698,192

UNIVERSAL JOINT EMPLOYING A FLUID BEARING FOR A MOVABLE NOZZLE

Clarence A. Le Febvre, Jr., San Jose, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 22, 1970, Ser. No. 48,203
Int. Cl. F02k *1/24*
U.S. Cl. 60—232 **18 Claims**



A universal joint permitting the relative axial angular deflection of two members comprises a receptacle in one of said members, a plug on the other of said members received in said recess and spaced apart therefrom, rolling seal means between the periphery of said receptacle and the periphery of said plug and a fluid filling the volume between the plug member, the seal means and the receptacle. Such a seal is particularly useful for permitting the relative angular deflection of two members which are subjected to loads tending to force the members towards each other such as are encountered, for example, in a reaction motor employing a movable nozzle where the blow-out loads on the nozzle tend to force the movable nozzle against the fixed nozzle support structure. This joint, with the receptacle, plug and seal means in annular form, is a lightweight, reliable, load bearing universal joint and nozzle seal which requires relatively low actuating forces.

3,698,193

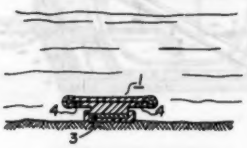
CONDUITS

Stewart F. Daymond, 383 Victoria Avenue, Chatham, Ontario, Canada

Continuation-in-part of Ser. No. 105,065, Jan. 8, 1971, which is a continuation of Ser. No. 790,544, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 710,371, March 4, 1968, abandoned. This application April 9, 1971, Ser. No. 132,648

Claims priority, application Canada, April 15, 1966, 958,055

Int. Cl. E02b *3/00*
U.S. Cl. 61—1 R **5 Claims**



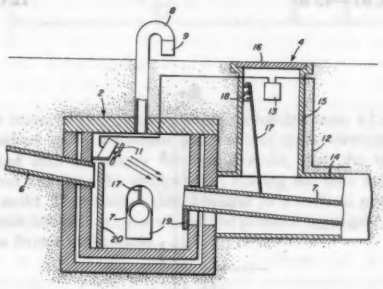
A weighted, elastically deformable conduit having discharge openings spaced along the length thereof and adapted to be submerged beneath the surface of a liquid to be agitated, aerated or displaced by means of compressed air discharged from said openings, is described. The conduit wall is sufficiently thin and flexible so that the conduit collapses under the influence of the liquid pressure on the outside of same when the supply of pressurized air to the interior of the conduit is shut off. In addition, the discharge outlets are located in those portions of the conduit wall adjacent the weight retaining means. Both these features contribute towards the elimination of foreign material from the interior of the conduit, especially around the discharge openings, which might tend to clog the latter.

3,698,194

AUTOMATICALLY AERATED LEACHING FIELD SYSTEM

John F. Flynn, 358 Strawberry Hill Road, Concord, Mass.

Filed Feb. 1, 1971, Ser. No. 111,209
Int. Cl. E02b *11/00*; B01d *21/10*; C02c *1/18*
U.S. Cl. 61—11 **11 Claims**



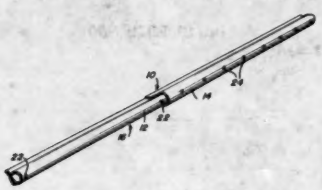
A sewage system comprising a septic tank, an air vented distribution chamber, and a leaching field formed of an array of air vented leaching canals. The flow of effluent from the distribution chamber into each leaching canal can be controlled from above ground. Air can be forced through the system by incorporating fans at the vents of the distribution chamber and leaching canals. By properly cycling the flow of air with the flow of effluent, a more efficient and longer lasting leaching field system with less pollution of nearby soil and water results, due to improved aerobic action, increased evaporation, and benefits from total drying of each canal.

3,698,195

WATER DISTRIBUTING HOSE

Richard D. Chapin, 368 North Colorado Avenue, Watertown, N.Y.

Filed May 25, 1970, Ser. No. 40,138
Int. Cl. E02b *13/00*; A01g *25/02*
U.S. Cl. 61—12 18 Claims



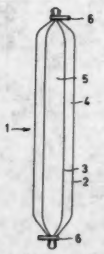
A water distributing hose for use in trickle irrigation comprising an outer tubular wall and an inner wall spaced interiorly from the outer wall and defining an inner tubular member fixed to the outer tubular wall for generally line contact therewith along the full length thereof. Both walls are perforated, normally in opposed relation to the line contact therebetween with the outer wall having a substantially greater number of openings. The inner tube functions so as to carry water along the full length of the hose and maintain, to a substantial degree, the pressure thereof. The water discharges through the inner wall openings and subsequently flows to and through the outer wall openings immediately adjacent to each inner wall opening for a trickle-like discharge therefrom.

3,698,196

METHOD FOR REINFORCING LOOSE ROCK AND COAL

Alfons Jankowski, Essen-Heisingen; Otto-Ernst Glaesmann, Castrop-Rauxel, and Gerhard Haake, Essen-Kray, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed March 3, 1971, Ser. No. 119,822
Claims priority, application Germany, March 4, 1970, P 20 10 140.0
Int. Cl. E21d *20/02*
U.S. Cl. 61—45 B 12 Claims



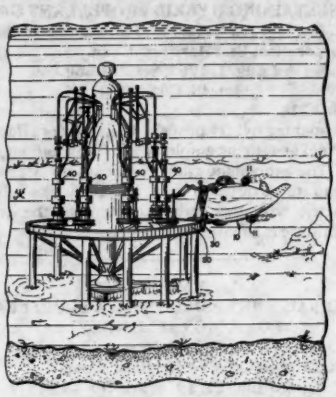
A plastic foil container having two separate compartments filled with the components of a foaming mixture, is inserted into a bore drilled into loose and caving rock or coal, and broken by a pointed rod inserted into the bore so that after sealing said bore with a plug a foam mixture fills, expanding due to swelling pressure, the bore and surrounds loose and caving rock or coal and reinforces the rock after hardening, particularly when the rod is left in the bore.

3,698,197

SUBMERGED PIER FOR MOVING A SUBMARINE UNDER WATER

Charles E. Bodey, 7412 McCool Avenue, Los Angeles, Calif., and Robert G. Cook, 2003 Avenida Feliciano, San Pedro, Calif.

Continuation-in-part of Ser. No. 771,903, Oct. 30, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,667
Int. Cl. B61b *13/02*; B63b *21/50*; E02b *3/06*
U.S. Cl. 61—46 4 Claims



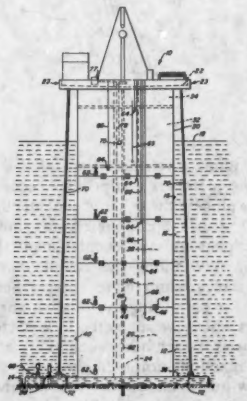
A pier positioned on the ocean floor having a circular track disposed around a working area, such as oil well heads, wherein the track is contoured to allow a descending submarine to engage the track at its upper edge and then, by losing buoyancy, pivot downward about the track to a horizontal position to engage the track under its lower edge. The submarine has drive wheels which engage the track to cause the submarine to move along the track to service the different well heads.

3,698,198

DEEP-WATER DRILLING, PRODUCTION AND STORAGE SYSTEM

Rex V. Phelps, Tulsa, Okla., assignor to Warren Petroleum Corporation, Tulsa, Okla.

Filed Feb. 12, 1971, Ser. No. 114,810
Int. Cl. E02b *17/00*
U.S. Cl. 61—46.5 8 Claims



An offshore platform for drilling wells and producing oil from wells comprising a plurality of stacked annular concrete

modules having concentric inner and outer walls enclosing a central opening that extends downwardly from the deck to the marine floor and a buoyancy chamber surrounding the central opening. The ends of the buoyancy chamber are closed to allow the modules to be floated to the well site. Means are provided to supply compressed air into the buoyancy chambers to control the amount of water in the buoyancy chambers to control the negative buoyancy of the platform and the load placed on the marine floor by the platform. The deck of the platform slopes downwardly from a curbing around its periphery to the central opening. Means are provided to lock the modules together into a unitary structure.

3,698,199

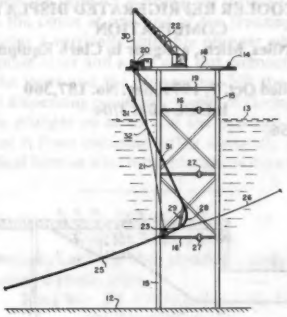
METHOD AND APPARATUS FOR INSTALLATION OF A FLOW LINE RISER ON AN OFFSHORE STRUCTURE

Jamie F. Matthews, Jr., Houston, Tex., assignor to Esso Production Research Company

Continuation of Ser. No. 802,458, Feb. 26, 1969, abandoned. This application March 22, 1971, Ser. No. 126,965

Int. Cl. E16l *1/00*; E21b *43/01*

U.S. Cl. 61—72.3 **22 Claims**



A flow line riser is installed on an offshore structure by laying a pipeline to a point on water bottom adjacent the structure and raising the offshore structure to water surface where lengths of pipe are attached perpendicularly to the pipeline to form a riser, the pipeline and riser being lowered to water bottom as the lengths of pipe are attached while longitudinally maintaining substantially constant tension on said pipeline. When the pipeline and connected riser reaches water bottom, it is then attached to the structure.

3,698,200

CRYOGENIC STORAGE DEWAR

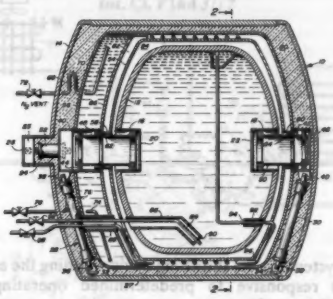
Glenn B. Johnson, Whitehall, and John L. Petering, Slatington, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 16, 1970, Ser. No. 98,629

Int. Cl. F17c *7/02*

U.S. Cl. 62—45 **7 Claims**

A non-continuous venting dewar for safely storing a cryogenic fluid during a prolonged period of transit with minimized evaporation of the cryogenic fluid. The dewar is characterized in that between the inner storage tank of the traditional vacuum-jacketed cryogenic storage dewar and the outer shell thereof, there is placed a plurality of spaced-apart radiation shields, the innermost of which is of relatively



greater mass than the others and can be reduced in temperature to approximately the level of the stored cryogenic fluid as the dewar is filled.

3,698,201

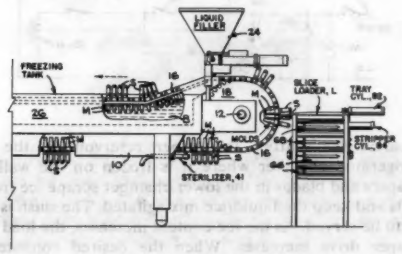
FREEZE MOLDING SLICE MATERIAL

Katsuji Hirahara, 781 Teresi Court, San Jose, Calif.

Division of Ser. No. 821,210, May 2, 1969, Pat. No. 3,604,319. This application April 2, 1971, Ser. No. 130,723

Int. Cl. F25d *25/00*

U.S. Cl. 62—62 **1 Claim**



Slice material (e.g., turkey slices) is loaded onto a loading tray backed up by a stripper bar. Both of these elements are projected into an empty horizontal mold, first the tray is retracted and then the stripper bar, leaving the slice material in the mold. The mold is then brought to a vertical position, filled with liquid (e.g., gravy) and the product aggregate is immersion frozen in the mold.

3,698,202

CONTROL SYSTEM FOR LOW TEMPERATURE REFRIGERATION SYSTEM

Dale J. Missimer, San Anselmo, Calif., assignor to Gulf & Western Industries, Inc., New York, N.Y.

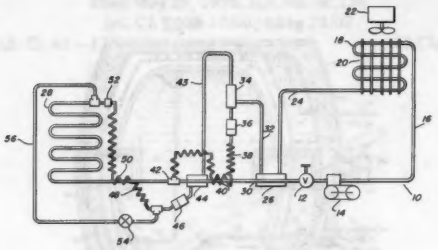
Filed Aug. 16, 1971, Ser. No. 171,874

Int. Cl. F25b *1/00*

U.S. Cl. 62—114 **15 Claims**

In a compression refrigeration cycle employing a mixture of refrigerants and a single compressor wherein low temperatures are reached by one or more vapor-liquid separations in which the expanded and cooled liquid from each separation stage is evaporated and used to condense the vapors from that

stage, high starting discharge pressures are avoided and rapid cool down to low temperature is achieved by incorporating a



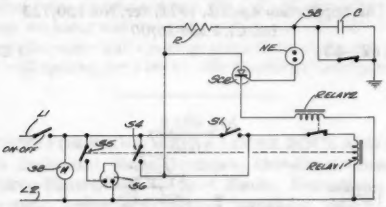
by-pass system for the throttling device feeding the evaporator which is responsive to predetermined operating characteristics of the cycle.

3,698,203

CONSISTENCY CONTROL FOR SLUSH FREEZER

Carl R. Stoelting, Kiel, Wis., assignor to Stoelting Brothers Company, Kiel, Wis.

Filed Feb. 4, 1971, Ser. No. 112,559
Int. Cl. F25c 7/10; G05d 24/02
U.S. Cl. 62—136 **5 Claims**



Liquid feeds from the upper reservoir to the lower refrigerated chamber where it is frozen on the walls. The scrapers and blades in the lower chamber scrape ice from the walls and keep the liquid/ice mix agitated. The slush is drawn off to be served. As the ice content increases, the load on the scraper drive increases. When the desired consistency is reached, the control shuts down the refrigeration. The control responds to torque and requires a sustained torque for a predetermined period to respond and shut down the compressor. The compressor is not restarted until the torque has dropped to a predetermined lower value.

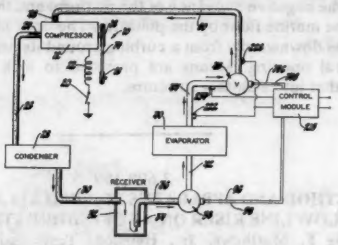
3,698,204

ELECTRONIC CONTROLLER FOR AUTOMOTIVE AIR CONDITIONING SYSTEM

David L. Schlotterbeck, and John R. Briar, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 16, 1971, Ser. No. 153,736
Int. Cl. F25b 41/00
U.S. Cl. 62—206 **5 Claims**

An automotive air conditioning system including a compressor, a condenser and an evaporator core over which air is directed and cooled for return to the passenger compartment of the car. The evaporator core is maintained at approximately 32° F. by the combined control of an expansion valve between the condenser and evaporator and a suction throttling valve between the evaporator and the inlet of the compressor. The expansion valve is controlled in response to the temperature of the outlet pipe of the evaporator core and the temperature of the outlet pipe from the suction throttling valve and the flow of refrigerant is metered through the valve to keep the core full of liquid refrigerant to assure maximum cooling efficiency. The suction throttling valve is controlled by sensing the temperature of the outlet pipe from the



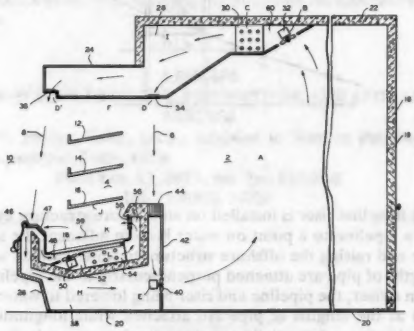
evaporator core and controlling a throttling piston by means of a transducer for converting electrical energy into mechanical movement of the throttling piston to maintain an evaporator pressure at a constant pressure of 29.5 psi plus or minus 0.5 psi to maintain tubes and fins of the evaporator core at approximately 32° F.

3,698,205

WALK-IN COOLER REFRIGERATED DISPLAY CASE COMBINATION

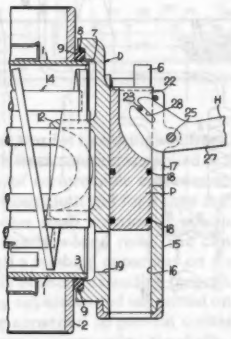
Arthur Perez, Niles, Mich., assignor to Clark Equipment Company

Filed Oct. 7, 1971, Ser. No. 187,360
Int. Cl. A04f 3/04
U.S. Cl. 62—256 **10 Claims**



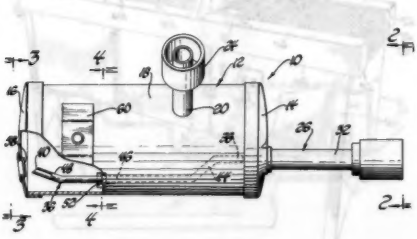
This is a combined refrigerated display case and walk-in cooler or cold room with the display case having a front opening for unimpeded access to the refrigerated area and a rear opening for unimpeded access from the walk-in cooler or cold room area. Each of these access openings has a curtain of refrigerated air thereacross to prevent the ambient room temperature air and the air from the cold room entering the refrigerated case space. The case has shelves therein from which goods may be removed through the front access opening and on which food may be deposited through the rear access opening. The case also has a separate horizontal curtain of refrigerated air across the lower portion of the refrigerated space to provide two vertically adjacent zones of refrigeration within the refrigerated space. The refrigerated air forming the curtain in front of the refrigerated display space is recirculated into the cold room or walk-in cooler space after passing under the refrigerated display case.

3,698,206
FREEZER DOOR AND DRAW OFF VALVE FOR A CONTINUOUS FREEZER
Bernfried M. Werner, Pompano Beach, Fla., assignor to Louis A. M. Phelan, Pompano Beach, Fla.
Filed July 29, 1970, Ser. No. 59,100
Int. Cl. F25c *7/08*
U.S. Cl. 62—342 **5 Claims**



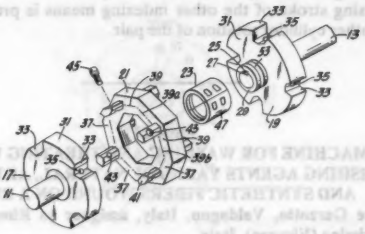
A continuous freezer for ice cream, malted, custard or the like in which the product is drawn off through a serving valve located in the cover at one end of the freezing cylinder. The valve includes a vertically shiftable plunger which is actuated by a swingable lever and a pin and slot connection is provided between the lever and the plunger to shift the latter between closed and dispensing positions. A pair of O-rings are provided around the plunger so as to seal the product in the cylinder and prevent it from escaping either upwardly or downwardly in the vertical bore in which the plunger is mounted.

3,698,207
ACCUMULATOR
William Melnyk, Lathrup Village, Mich., assignor to McCord Corporation, Detroit, Mich.
Filed Nov. 25, 1970, Ser. No. 92,756
Int. Cl. F25b *43/00*
U.S. Cl. 62—503 **13 Claims**



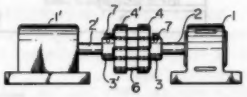
An accumulator including a casing having top and bottom ends interconnected by a cylindrical side wall. An inlet conduit extends radially through the cylindrical side wall and an outlet extends from the top end of the casing. An aspirator tube has a first end disposed in the outlet and extends downwardly and slants radially outwardly to a portion which extends along the cylindrical wall and then slants radially inwardly and downwardly to a second end adjacent the bottom end of the casing. The aspirator tube is connected to the side wall of the casing by welding, as brazing and the like, and/or by a clip into which the tube is snapped into position. The bottom end of the casing has a hole with a plug therein disposed adjacent the second end of the aspirator tube.

3,698,208
FLEXIBLE COUPLING
Charles H. Williams, Export, Pa., assignor to Koppers Company, Inc.
Filed Feb. 2, 1971, Ser. No. 112,006
Int. Cl. F16d *3/17*
U.S. Cl. 64—11 R **5 Claims**



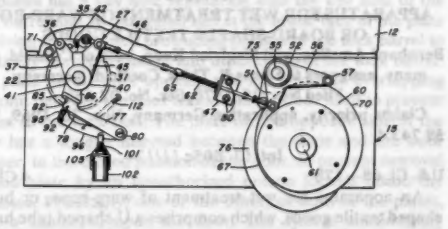
A flexible coupling for two generally coaxially arranged shafts has a hub for each shaft, a flexible means disposed between and securely fixed to the hubs for tolerating axial misalignment between the shafts and a rigid means coaxially disposed between and loosely attached to the hubs for limiting axial movement of the hubs in respect of each other.

3,698,209
JOINT DEVICE
Kazuo Moro, 55, Higashi Asakawa-machi, Tokyo, Japan
Filed Jan. 25, 1971, Ser. No. 109,517
Int. Cl. F16d *3/64*
U.S. Cl. 64—12 **6 Claims**



A joint device adapted to be used particularly in small apparatuses. Rotation torque of driving shaft is transmitted from a wheel fixed to said shaft to an opposed wheel fixed to driven shaft through a resilient wire alternately hung to respective one of said wheels substantially along their periphery.

3,698,210
PATTERN MECHANISM FOR KNITTING MACHINES
Rudolph G. Anke, Reading, and James D. Moyer, Wyomissing, both of Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Oct. 14, 1970, Ser. No. 80,544
Int. Cl. D04b *15/00*
U.S. Cl. 66—155 **1 Claim**



Pattern mechanism for a circular knitting machine, the pattern mechanism including a cam drum, first and second index-

ing means movable through indexing strokes to successively index the cam drum during first and second rotations of pairs of rotations of the needle cylinder of the machine, and means for controlling the indexing strokes of the first and second indexing means whereby the indexing strokes of both indexing means are prevented during the pairs of cylinder rotations, indexing strokes of both indexing means are permitted during a pair of cylinder rotations, or the indexing stroke of one of the indexing means is permitted in one cylinder rotation and the indexing stroke of the other indexing means is prevented in the other cylinder rotation of the pair.

3,698,211

MACHINE FOR WASHING AND TREATING WITH FINISHING AGENTS YARNS OF NATURAL, ARTIFICIAL AND SYNTHETIC FIBERS WOUND ON A REEL

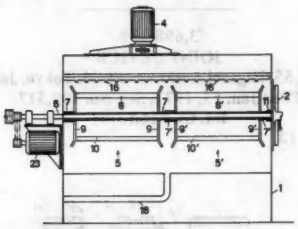
Felice Garzotto, Valdagno, Italy, assignor to Rimar S.p.A., Trissina (Vicenza), Italy

Filed Jan. 22, 1971, Ser. No. 108,861

Claims priority, application Italy, Feb. 19, 1970, 20818 A/70

Int. Cl. B05c *8/02, 11/10*

U.S. Cl. 68—19.2 **6 Claims**



A machine for washing and/or applying finishing agents onto yarns in form of skeins, which prevents any type of friction to the yarn fibers. The machine substantially comprises one or more cells in each of which is rotatably mounted at least one reel on which the skeins of yarns are disposed. At the upper part of each cell a row of nozzles is provided for spraying the washing or treatment liquid and a longitudinal slot for blowing an air flow drying the yarns. Each reel comprises a number of spokes one half of which are movable and alternately disposed between two adjacent stationary spokes on which are pivotedly and resiliently mounted. An example of a complete treatment cycle of the machine is also given.

3,698,212

APPARATUS FOR WET TREATMENT OF WARP-ROPE OR BOARD-SHAPED TEXTILE GOODS

Bernhard Ameling, and Siegfried Kaup, both of Coesfeld, Germany, assignors to Firma B. Thies, Coesfeld, Germany

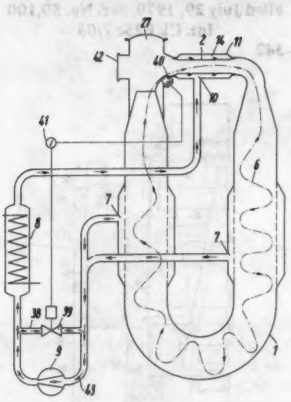
Filed Nov. 25, 1970, Ser. No. 92,666

Claims priority, application Germany, Nov. 28, 1969, P 19 59 743.4

Int. Cl. B05c *11/124*

U.S. Cl. 68—178 **4 Claims**

An apparatus for wet treatment of warp-rope, or board-shaped textile goods, which comprises a U-shaped tube having at least two leg members, to constitute a treatment container. A drive set is provided which connects the leg members, and is adapted to circulate therein the textile goods. A liquid pump feeds liquid to the drive set and has a suction side and a pressure side. A connection conduit is disposed between the suction side and the pressure side of the pump, and a control member is provided in the connection conduit and serves the control of the quantity of the liquid to be fed.



3,698,213

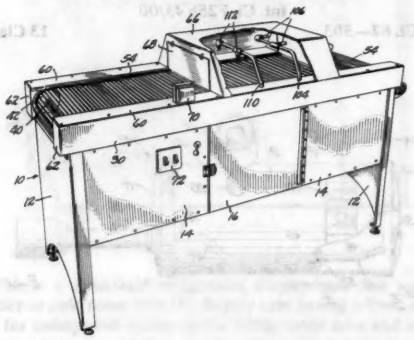
APPARATUS FOR TREATING DUST MOPS, DUST CLOTHS, AND RUGS

Fred A. Mann, Jr., 504 North Nottawa Street, Sturgis, Mich.

Filed Feb. 25, 1971, Ser. No. 118,728

Int. Cl. B05c *9/04, 11/10*

U.S. Cl. 68—205 R **6 Claims**



Apparatus for treating fabric and other articles by spraying liquid thereon while advanced by an apertured flexible conveyor belt through a spray-confining hood. Spray precipitate is collected on a collection pan below the conveyor and discharged into a sump. A liquid circulating system is connected to a liquid container and has valve means therein responsive to means sensing the presence of articles on the conveyor, valved normally closed bypass means for supplying spray means, and normally closed pressure responsive valve means for draining liquid in the system to the sump. The sump has valved liquid return means connected to the system.

3,698,214
CONTINUOUS WASHING APPARATUS

Erwin B. Bahnsen, Hinsdale, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

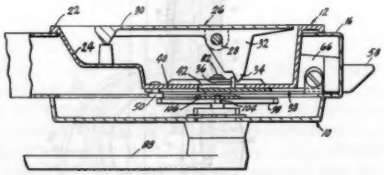
Filed Nov. 25, 1969, Ser. No. 879,764
Int. Cl. B05c 5/00
U.S. Cl. 68—205 R 38 Claims

Method and apparatus for loosening soil from a mass of pervious cloth in which wash solution is applied to the rolls in the form of a plurality of reciprocable cascades to maintain the surfaces of the pervious cloth wet for a time sufficient to saturate the same; excess wash solution is continually drained from the mass of tightly wound rolls. The cloth articles are transported through a washing apparatus on a conveyor supported by a plurality of shafts extending through movable side walls of the washing apparatus and supported on bearings outside of the washing apparatus to prevent contact of the wash solution with the bearings supporting the shafts, orbital movement of the movable walls imparts similar orbital movement to the conveyor supported by the shafts to impart cycloidal movement to the cloth articles transported by the conveyor. The cloth articles are rinsed by directing a mist of gas and rinse liquid along a path normal to the articles therethrough to prevent puddles of the rinse liquid and the wash solution from forming thereon; thereafter, liquids are expressed from the articles by feeding the articles onto the side of a freely rotatable cylinder and therearound and upwardly between the cylinder and an associated roller, the cylinder and the roller are urged toward each other to press the articles therebetween to express the liquid therefrom. A dryer completes the drying of the articles.

3,698,215
DOOR LOCK

John A. Truhon, 16514 Blackstone Avenue, Detroit, Mich.

Filed April 7, 1971, Ser. No. 132,158
Int. Cl. E05b 5/00, 65/02
U.S. Cl. 70—152 12 Claims

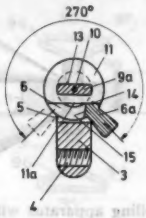


A door lock having a recessed door handle at the outer side thereof, the thickness of the lock being maintained at a minimum so that it can be used on relatively thin doors (for example, the exterior door of a mobile home) by forming numerous components of the lock, including the bolt, as relatively thin flat metal stampings. The bolt is adapted to be retracted by actuating an exterior handle mounted within a recessed outside escutcheon plate or by an inside handle mounted on an inner escutcheon plate. The door lock includes a lock cylinder key operated from the exterior and, if desired, by a push button from the inside for enabling or preventing retraction of the lock bolt.

3,698,216
AN INSERTABLE CYLINDER FOR A DOOR LOCK

Ernest Keller-Volper, 6, Querstrasse, 8805 Richtersell, Switzerland

Filed Feb. 11, 1971, Ser. No. 114,569
Claims priority, application Switzerland, Feb. 13, 1970, 2146/70
Int. Cl. E05b 17/04
U.S. Cl. 70—380 6 Claims

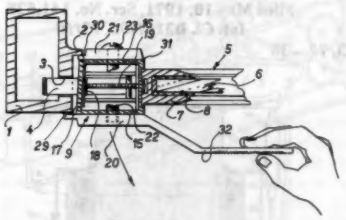


A cylinder for a door lock is comprised of a casing insertable into the lock and provided with two spaced portions separated by a slot and each carrying a rotatable drum. The spaced portions are integral with a solid, depending limb which is provided with a threaded opening for securing the cylinder in the lock. A rotatable actuator disk with a radially projecting cam is supported in the slot and is driven in rotation by a carrier disk in the form of a circular segment.

3,698,217
DOOR LOCK GUARD

Fernand Roy, 405 Vanier Street, Ville Brossard, Quebec, Canada

Filed June 22, 1971, Ser. No. 155,488
Claims priority, application Canada, May 25, 1970, 113850
Int. Cl. E05b 9/08
U.S. Cl. 70—451 11 Claims

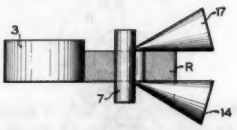


A guard system for door locks mainly used in metal doors. The guard system comprises two elongated registering plates applied on both sides of the door around the door lock and secured together by means of through bolts. At least one of the plates has a key hole registering with the key hole of the lock barrel and an elongated slot at the inside face of the plate receiving an elongated protruding portion of the lock barrel to positively prevent rotation and unscrewing of the lock barrel. The plate on the door opening side has a tongue overlapping the joint between the door frame and the door itself to prevent access to the lock bolt. The plate on the opposite side of the door has a tongue inserted between the door and the door stopper, in the closed position of the door, to prevent removal of said plate by an unauthorized person locked inside the premises. Preferably, one or the other, or both of the plates, form a handle to open the door. The system considerably diminishes the possibilities of tampering with the door lock mechanism.

3,698,218
ROLLING MILLS

Eugen Wieting, Hamm in Westphalia, Germany, assignor to J. Banning Aktiengesellschaft, Hamm, Westfalen, Germany

Continuation of Ser. No. 845,819, July 29, 1969, abandoned. This application June 18, 1971, Ser. No. 154,659
Claims priority, application Germany, July 31, 1968, P 17 52 887.9
Int. Cl. B21b 37/00
U.S. Cl. 72—10 9 Claims

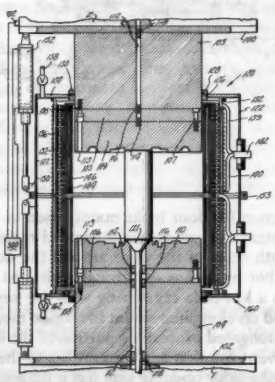


A four-roll ring rolling apparatus with a pair of rolls for rolling the two curved ring faces and a pair of conical rolls which roll the radial faces of the ring and can be displaced in relation to the ring radially. One roll of each pair of rollers can be fed towards the other radially. At least one roll of each roll pair can be driven. The conical roll pair of rolls is arranged to be automatically displaced in accordance with the increase in the external diameter of the ring owing to the displacement of a feeler roller or the like sensing this diameter at a position adjacent to the pair of rolls, so that it always acts on the radial ring face. The speed of the displacement drive for the conical-roll pair is controlled so as to correspond at least approximately to the speed of increase in ring or hoop diameter. The speed of rotation of the conical-roll pair should be capable of being changed in accordance with the movement of the ring or hoop in relation to the conical rolls in a stepless manner.

3,698,219
APPARATUS FOR FORGING

Joseph B. Moore, Tequesta, and Roy L. Athey, North Palm Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 10, 1971, Ser. No. 141,528
Int. Cl. B21j 1/06, 13/10
U.S. Cl. 72—38 17 Claims

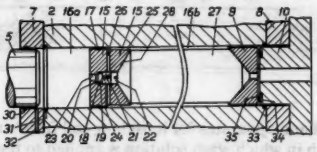


Forging means are shown wherein a heating device is located around the dies so that the heat can be controlled while the press is being operated. Means are provided to place an inert atmosphere or vacuum around the dies while they are forging a billet. Chambers are located adjacent the forging means to preheat one billet while another billet is being forged and also to insert and remove a billet without losing much of the heat or forging atmosphere.

3,698,220
PRESS FOR HOT HYDROSTATIC EXTRUSION

Jan Nilsson, and Hans Larker, both of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 20, 1971, Ser. No. 145,183
Claims priority, application Sweden, May 26, 1970, 7171/70
Int. Cl. B21d 25/06
U.S. Cl. 72—60 3 Claims



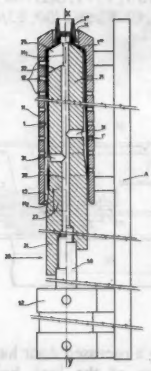
A press for hot hydrostatic extrusion of a billet, has a stand, a pressure chamber axially movable in the stand to engage a die mounted in one end against a die support carried by the stand, a punch slidable in the pressure chamber to raise a pressure medium in the pressure chamber to extrusion pressure, and a billet holder slidable in the chamber for pressing the billet against the die during sliding movement of the pressure chamber to closing position.

In order to prevent contact between the die support and the die until extrusion is about to begin, with consequent cooling of the billet which interferes with the extrusion, an annular canted spring is arranged in a groove in the face of the die support opposite the die so as to prevent contact therebetween during closing movement of the pressure chamber.

3,698,221
APPARATUS FOR TAPERING FLEXIBLE METAL TUBES

Roger Couland, Fontenay-aux-Roses, France, assignor to Societe de Conditionement en Aluminum, Paris, France

Filed June 22, 1971, Ser. No. 155,540
Claims priority, application France, June 26, 1970, 7023778
Int. Cl. B21d 26/04
U.S. Cl. 72—62 10 Claims



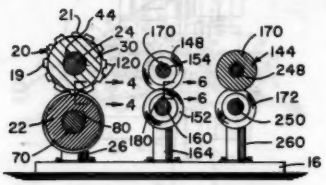
Apparatus for converting flexible metal cylindrical tubes into nestable tapered tubes including a mandrel having a cylindrical portion shorter than the tube and a frustoconical portion whose largest diameter is equal to or greater than the filling opening of the tube and in which air is blown through ducts in the mandrel to force the tube against the inner surface of a matrix while the mandrel advances and the frusto-conical portion compensates for the widening of the bottom opening and the shortening of the length of the tube.

3,698,222

PERFORATING MACHINE

Darrell N. Blake, 143 Glen, Council Bluffs, Iowa

Continuation-in-part of Ser. No. 673,391, Oct. 6, 1967, abandoned. This application Oct. 13, 1969, Ser. No. 871,443
Int. Cl. B21d *13/04, 28/36*
U.S. Cl. 72—129 5 Claims



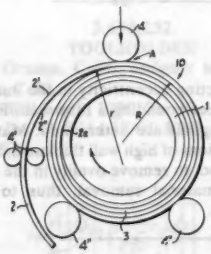
A machine for manufacturing corrugated perforated material having successive sets of corrugation forming roll means preceded or succeeded by rotating punch and die roll means cooperatively correlated with the corrugated roll means in a manner for forming openings in material in positions such that the openings will have side flanges extending outwardly from the crests of the finished corrugated material, the punch roll being formed of discs separated by spacers, each disc having a special shape for the sharpening of punches projecting therefrom.

3,698,223

APPARATUS FOR SPIRALLY WINDING STRIP METAL

Hideo Sagara, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Ciyoda-ku, Tokyo, Japan

Division of Ser. No. 667,547, Sept. 13, 1967, Pat. No. 3,528,162. This application Dec. 16, 1969, Ser. No. 888,094
Claims priority, application Japan, Sept. 27, 1966, 41/63598
Int. Cl. B21c *47/00*
U.S. Cl. 72—146 2 Claims



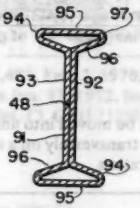
Apparatus for spirally winding strip metal comprising a pressure roll for urging the strip metal into a coil, feed rolls for feeding the strip material to the pressure roll and combining with the pressure roll to increase the radius of the strip material immediately preceding its application to the coil, and means for supporting the coil as it is wound and for maintaining the coil in contact with the pressure roll.

3,698,224

PROCESS FOR THE PRODUCTION OF STEEL STRUCTURAL SHAPES

Adam Eric Saytes, Maracaibo, Venezuela, assignor to Siderurgica Occidental C.A., Maracaibo, Venezuela

Continuation of Ser. No. 821,843, May 5, 1969, abandoned. This application Nov. 16, 1970, Ser. No. 89,603
Int. Cl. B21d *47/00*
U.S. Cl. 72—178 1 Claim



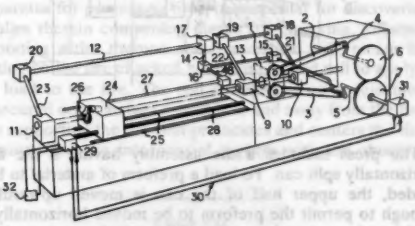
Steel structural shapes such as "H," "I," and channel beams are cold fabricated by progressively deforming welded seam steel tubing made from hot or cold rolled steel in a welded tube mill, the structural shapes being closed curves in section and having web portions of two adjacent thicknesses with flange portions at each end thereof.

3,698,225

INTERMITTENTLY ACTING ROLLING MILL

Pierre Peytavin, Neuilly-sur-Seine, France, assignor to Societe anonyme dite: Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Bugeaud, Paris, France

Filed Dec. 29, 1969, Ser. No. 888,659
Int. Cl. B21b *17/10*
U.S. Cl. 72—208 8 Claims



Intermittently acting rolling mill comprising continuous rotary drive means, a roll cage which is reciprocated longitudinally of the work, means by which said work is intermittently rotated, and means for converting the continuous rotary movement of said drive means to reciprocating movement to drive said cage and intermittent rotary movement to turn said work in synchronism with the movement of said cage.

3,698,226

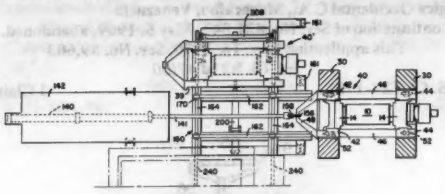
ROLL CHANGERS

Werner W. Eibe, Pittsburgh, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed July 1, 1971, Ser. No. 158,930
Int. Cl. B21b *31/08*
U.S. Cl. 72—239 30 Claims

A roll changer for rapidly changing the work rolls of a rolling mill particularly designed for incorporation into existing mills. The roll changer includes a cartridge adapted to support the work rolls during a roll changing operation and pro-

vided with rotatable wheels which are turned by a rotatable rail section on a side shifting platform so that the work roll



carrying cartridge can be moved into and out of the mill along a first pair of rails and transversely on a second set of rails during a side shifting operation.

3,698,227

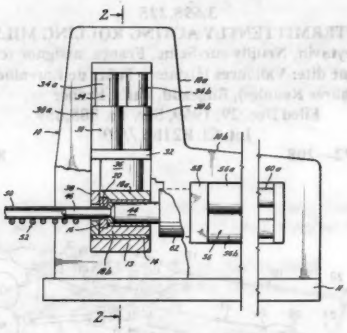
EXTRUSION PRESS AND METHOD

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Sept. 14, 1970, Ser. No. 71,872

Int. Cl. B21c *23/00, 27/00*

U.S. Cl. 72—263 **9 Claims**



The press includes a die assembly having a die and a horizontally split can. To load a preform of material to be extruded, the upper half of the can is moved upwardly far enough to permit the preform to be moved horizontally to a position between the two halves of the can and then downwardly into the lower half of the can. The upper half of the can is then moved back into engagement with the lower half to enclose the preform and confine it as the preform is extruded horizontally through the die assembly.

3,698,228

ROD FORMING PROCESS AND APPARATUS

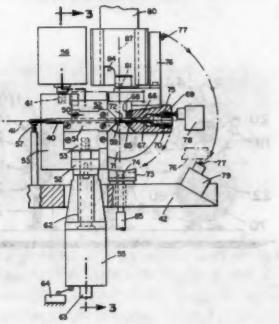
William G. Campbell, Chalfont, Pa., assignor to Hurst Performance Inc., Warminster, Pa.

Filed Dec. 1, 1970, Ser. No. 94,095

Int. Cl. B21d *11/04, 31/00*

U.S. Cl. 72—306 **21 Claims**

A process and apparatus for performing same are disclosed for making a uniform bend of original rod cross-section or larger than original cross-section, and coining a circular flange on the rod adjacent to the bend, without detrimental folding between flange and rod, in one clamping cycle, by first bending the rod about a pivot point displaced from the center line of the rod so as to produce with a minimum of tensile stresses a bend with a bulge of excess rod material at the point of the bend, and then pressing the rod at the bend to coin an annular flange partially from such excess material and partially from the bent rod extension, leaving the rod of a uniform diameter around the entire bend. The supporting structure which holds the rod during the pressing step is moved in the direction of



the press force in coordination with the application of the press force, in order to take up material in the length of the bent rod extension while forming the flange, and to avoid bending anywhere along the rod except at the desired bend.

3,698,229

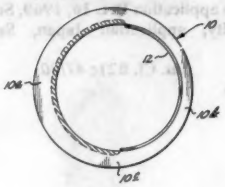
REDUCING TUBE-WALL ECCENTRICITY IN TUBE INTERMEDIATES

Ivan Baksay, 1113 West 29th Street, Albany, Oreg.

Filed May 17, 1971, Ser. No. 143,830

Int. Cl. B21c *37/30*

U.S. Cl. 72—341 **3 Claims**



A method of correcting eccentricity in the inner and outer circumferential surfaces bounding a tube wall. First high and low wall thickness regions are determined. Material then is removed from the regions of high wall thickness. Subsequently the tube wall is worked, to remove ovality in the cross section introduced by the material removal, thus to reintroduce roundness to the tube.

3,698,230

PULLING POST BASE

Ervin Buske, P.O. Box 190, Gowrie, Iowa

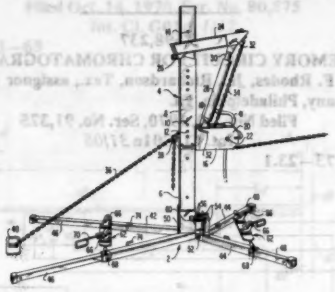
Filed June 28, 1971, Ser. No. 157,505

Int. Cl. B21d *9/14*

U.S. Cl. 72—386 **11 Claims**

For use with a pulling post of the type used for applying tension via a chain to a damaged automobile, a base having retractable rollers is formed of two V-shape sections pivoted together at their apexes. One of the sections has a post socket. The sections are spring biased to pivot relative to one another

and normally form an angle. When tension is applied via the chain, the base sections pivot contra to the spring bias and



flatten out against the floor. Thus, all slack is removed from the chain before strong pulling force is applied.

3,698,231

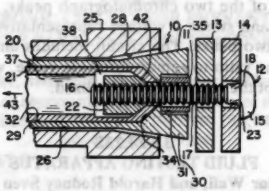
FASTENING TOOLS

Samuel B. Davis, Jr., New Galilee, Pa., assignor to Vits Maschinenbau GmbH, Langenfeld (Rhineland), Germany

Filed April 22, 1971, Ser. No. 136,346

Int. Cl. B21d *9/05*; B23p *11/00*

U.S. Cl. 72—391 **5 Claims**



A crimp lock fastener tool for joining a swageable collar to a threaded lockbolt includes a stationary housing and a floating split collet which swages the collar to the threads of the lockbolt and severs the remainder of the lockbolt at a point adjacent the collar. The swaging and simultaneous shearing results from the interaction of the inclined surfaces of the stationary housing and the split collet.

3,698,232

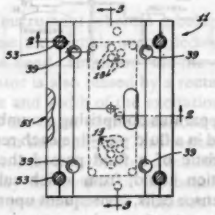
TOOLHOLDER

Paul Vinson, Orange, Calif., assignor to Vinson Industries, Inc., Orange, Calif.

Filed July 9, 1970, Ser. No. 53,509

Int. Cl. B21d *37/00*; B21k *21/00*

U.S. Cl. 72—482 **22 Claims**



A toolholder for mounting inner and outer telescoping tools comprising a body having a cavity therein and structure for mounting the outer tool. A member is provided in the cavity and the inner tool is connected to the member for movement therewith. The member can be retained in a working position in which the inner tool is in position to perform a work operation and a grinding position in which the inner tool is withdrawn from the working position.

3,698,233

APPARATUS FOR PROCESSING CURED TIRES

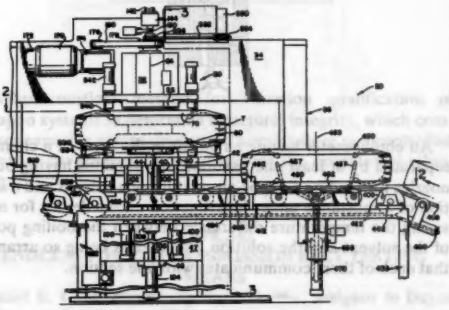
William D. Braden, Stow; Richard P. Marshall, Tallmadge; Richard J. Greenhorn, Stow, and Arnold S. Buser, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 7,489, Feb. 2, 1970, Pat. No. 3,656,343.

This application Jan. 17, 1972, Ser. No. 218,180

Int. Cl. G01l *25/00*

U.S. Cl. 73—1 B **3 Claims**



Apparatus for processing tires, in particular for discovering anomalies therein comprising means for chucking, inflating, and rotating a tire thereon about a vertical axis, means for operating on the tire chucked by moving a load roll to apply a radial load to the tire. The roll is mounted on a delectable yoke secured on a carriage movable to and away from the tire. Means supporting the tire first prelocates and centers the tire, then moves the tire into coaxial registry with the chucking means.

3,698,234

PROCESS FOR NONDESTRUCTIVE INSPECTION

Sidney Allinikov, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 18, 1970, Ser. No. 90,813

Int. Cl. G01n *25/18*

U.S. Cl. 73—15 **8 Claims**

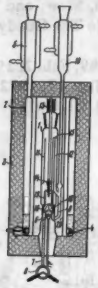
A substituted 1,3,3-trimethylindolinobenzopyrylospiran is mixed with a nonpigmented, organic-soluble, resin base paint or with an organic-soluble, resin base paint containing a small amount of white pigment and a thin coat of the mixture is applied to the surface of a laminated article. The coating is then activated by ultraviolet light. Activation causes the coating to assume a color. After activation, the coating is heated to a temperature of approximately 125° F. Upon heating, any portion of the coating directly over a weakly bonded or nonbonded portion of the laminated article will return to its original colorless or white state. Any portion of the coating directly over a strongly bonded portion of the laminated article will retain its color. Thus, this invention is useful in that it permits the detection of weakly bonded or nonbonded portions of laminated articles.

3,698,235

EBULLIOMETER

Nikolai Petrovich Mikhailov; Lev Moiseevich Rapoport, and Samuil Zalmanovich Taits, all of Moscow, U.S.S.R., assignors to Institut Organicheskoi khimii im. N.D. Zelinskogo AN SSSR, Moscow, U.S.S.R.

Filed June 11, 1970, Ser. No. 45,353
Int. Cl. G01n *25/08*
U.S. Cl. 73—17 A **2 Claims**



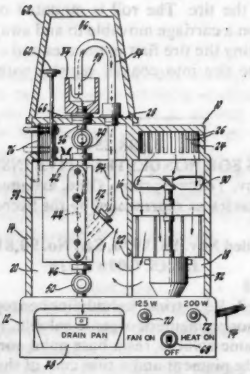
An ebulliometer having an air lift in the form of a chamber separated by at least one partition into sections having outlet nozzles for feeding a vapor-air mixture of a solvent and a solution of a substance under investigation onto a device for measuring the temperature difference between the boiling points of the solvent and the solution, the nozzles being so arranged that each of them communicates with one section.

3,698,236

FLUID VAPORIZATION TESTER WITH HOT AIR PURGE AND METHOD

Francis J. Markey, Lewisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1971, Ser. No. 110,853
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 A **3 Claims**



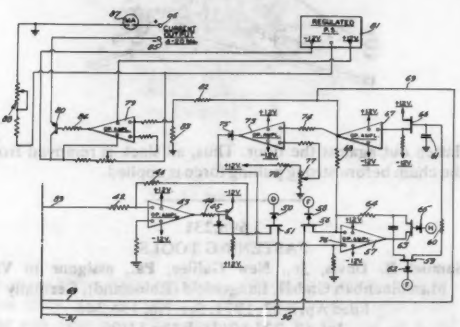
A visual fluid vaporization indicator in which a sample of the test fluid is placed in a boiler, heated to cause a percolating action until a fluid column surges through the visual indicator tube at the vaporization temperature of the fluid, this temperature being measured and considered to be the boiling point of the fluid sample. After the test is completed, a drain valve is opened to drain the fluid sample from the boiler, and a cooling fan is energized to blow air to cool the boiler, hot air having passed over the boiler being directed through the boiler and the visual indicator tube and out the drain valve to purge the system of the remains of the fluid which was tested, as well as cooling the boiler, prior to inserting another fluid sample.

3,698,237

MEMORY CIRCUIT FOR CHROMATOGRAPHS

Charles F. Rhodes, Jr., Richardson, Tex., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Nov. 20, 1970, Ser. No. 91,375
Int. Cl. G01n *31/08*
U.S. Cl. 73—23.1 **8 Claims**



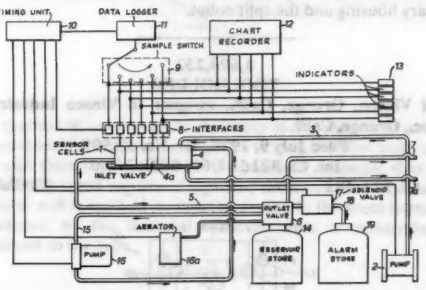
A solid-state circuit useful with a two-component vapor phase chromatograph provides and stores a voltage representative of one of the two chromatograph peaks, and, in addition, obtains and stores a voltage representative of the ratio between the two peaks. The circuit includes an arrangement for limiting the ratio to some adjustable value, which enables the full scale of the recorder to be utilized.

3,698,238

FLUID TESTING APPARATUS

Reginald Victor Wall, and Harold Rodney Sven Page, both of Dorset, England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 9, 1971, Ser. No. 113,971
Int. Cl. G01n *11/00*
U.S. Cl. 73—53 **5 Claims**



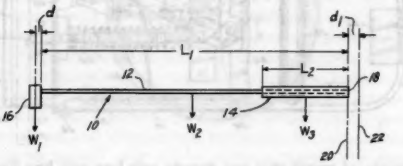
Fluid testing apparatus comprising a number of sensor cells serially connected in a fluid pipe-line each responsive to a particular characteristic of a fluid passed therethrough and a store for calibration liquid, from which calibration liquid is released to the sensor cells, consequent upon the operation of a valve. The apparatus may also comprise a further valve which is operated when fluid of a particular characteristic is detected so that this fluid can be stored for subsequent analysis.

3,698,239

DYNAMICALLY MATCHED SET OF GOLF CLUBS

James L. Everett, III, 743 Mancill Road, Strafford, Pa.

Filed Oct. 14, 1970, Ser. No. 80,575
Int. Cl. G01m 1/12
U.S. Cl. 73—65 2 Claims



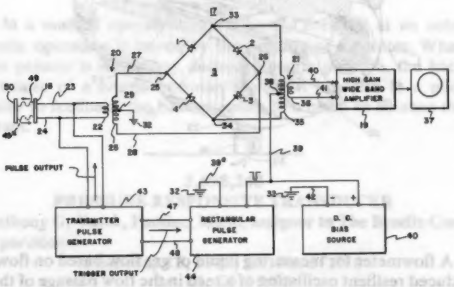
A dynamically matched set of golf clubs having identical moments of inertia with respect to a common swinging axis and, starting with a selected favored club, the method of determining by calculation from simple length and weight parameters, the head weights required for dynamically matching the other clubs of the set to the favored club. Use is made of the fact that the moment of inertia of a conventional golf club with respect to a swinging axis can be represented by the summation of the moments of inertia of the grip, the shaft and the head components.

3,698,240

ELECTRONIC CIRCUIT FOR PREVENTION OF RECEIVER PARALYSIS IN ULTRASONIC ECHO RANGING

Otto R. Gericke, Medfield, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 29, 1971, Ser. No. 184,741
Int. Cl. G01n 29/04
U.S. Cl. 73—67.9 3 Claims



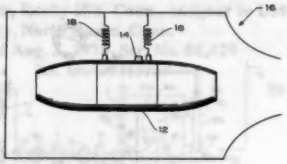
A pulse-echo instrument wherein a balanced modulator is d.c. biased to pass a.c. signals is coupled between the transducer and wide-band amplifier of the instrument. The balanced modulator is also biased by a rectangular pulse having the amplitude and width of the excitation pulse applied to a transducer and the input of the balanced modulator, but of opposite polarity to the d.c. bias. This rectangular pulse is applied to the balance modulator coincidentally with the excitation pulse whereby the output of the balanced modulator is held at ground optential for the duration of the excitation pulse thereby preventing current flow in the output of the balanced modulator during the duration of the excitation pulse whereby paralysis of the wide-band amplifier by the excitation pulse is prevented.

3,698,241

VIBROACOUSTIC TEST METHOD

Peter Bouclin, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 1, 1971, Ser. No. 119,979
Int. Cl. G01h 1/00; B06b 1/00
U.S. Cl. 73—69 1 Claim



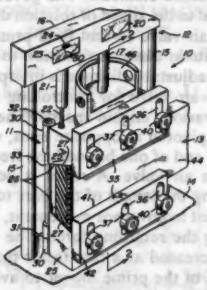
Vibroacoustical method for vibration qualification of weapon systems to determine structural integrity, which comprises exposing externally carried aircraft store to a controlled acoustic environment which develops the operational vibration environment.

3,698,242

ENDLESS POWER TRANSMISSION BELT TESTING MEANS

Donald E. Clinkenbeard, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed July 15, 1971, Ser. No. 162,889
Int. Cl. G01n 3/08
U.S. Cl. 73—94 14 Claims



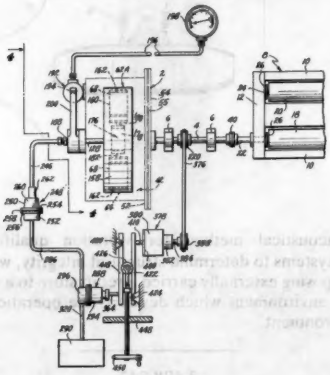
An endless power transmission belt holding fixture and apparatus using the same is provided wherein the fixture has a pair of supports each having an inclined bearing surface and the bearing surfaces correspond in inclination to the inclination of the sides of a power transmission belt to be held in the fixture. The fixture has means guiding the supports for movement towards and away from each other and the belt is retained from moving out of the fixture in a direction transverse the inclined bearing surfaces whereupon the fixture enables a power transmission belt to be compressed in an edgewise manner to thereby determine the amount such belt is compressed upon applying a particular compressive force thereagainst.

3,698,243

APPARATUS FOR CONTROLLING THE CHARACTERISTICS OF FLUID PRESSURE OPERATED FRICTION TYPE POWER ABSORPTION DEVICES

Edwin L. Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Division of Ser. No. 559,490, July 22, 1966, Pat. No. 3,453,874. This application July 3, 1969, Ser. No. 839,005
Int. Cl. G01l *3/16*
U.S. Cl. 73—135 **12 Claims**



Apparatus for controlling a rotary power absorber while absorbing driving torque produced by a prime mover. The power absorber includes a housing containing fluid pressure operated brake elements that are actuatable hydraulically to provide retarding force. The control means for the brake applying means includes a governor-controlled air valve and a transducer which converts air pressure into hydraulic pressure for actuating the brake elements. The governor is driven at a speed proportional to the speed of rotation of the prime mover and actuates the air valve so that fluid pressure is applied to the brake elements in direct proportion to the speed of the prime mover. An adjustable linkage is interposed between the governor and the air valve for controlling the maximum retarding force at various engine speeds. The linkage includes two parallel bars pivoted at opposite ends, with the governor acting on the free end of one bar and the free end of the other bar acting on the air valve. A roller is positionable at any desired point along the length of the bars to vary the ratio of air valve movement to governor movement, as desired, to correspondingly vary the retarding force. The retarding force is increased and decreased at a rate faster than the changes in speed and torque of the prime mover to avoid stalling of the prime mover as frequently occurs when a constant load is sought to be applied to the prime mover and there is a momentary failure in power of the prime mover.

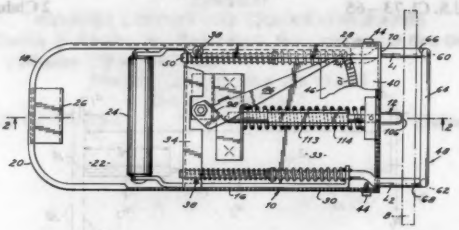
3,698,244

BELT TENSION GAUGE

Roy Deming, Royal Oak, Mich., assignor to Kent-Moore Corporation, Warren, Mich.

Filed Dec. 17, 1970, Ser. No. 99,006
Int. Cl. G01l *5/04*
U.S. Cl. 73—144 **7 Claims**

A belt tension gauge for automotive accessory drive belts clamps a length of the belt at spaced apart locations along the belt and deflects the clamped length over a spring-loaded plunger operating a lazy hand pointer sweeping a scale face



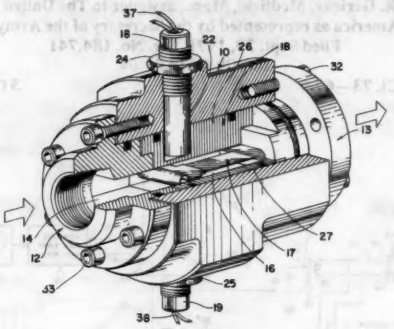
with the amount of plunger depression, when the belt is clamped, being a function of belt tension reflected by the pointer position relative to the scale.

3,698,245

FLUID OSCILLATOR FLOWMETER

George C. McNabb, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed April 14, 1970, Ser. No. 28,331
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B **19 Claims**



A flowmeter for measuring liquid or gas flow based on flow-induced resilient oscillation of a reed in the flow passage of the meter. An output sensor responds to the oscillations to produce a frequency output. The oscillations are produced by alternately retarding and accelerating each of two parallel flow paths. Between these flow paths is mounted a vane, resiliently spring at its downstream end, having a bulbous nose piece at its upstream end, and with a significant 'sail' area in its middle portion.

3,698,246

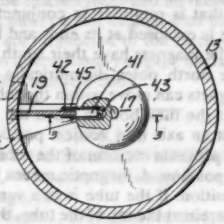
THRUST PISTON FLUID METERS

Howard E. Rittenhouse, 919 South 19th Street, Rogers, Ark.

Filed Sept. 24, 1971, Ser. No. 183,390
Int. Cl. G01f *3/12*
U.S. Cl. 73—258 **9 Claims**

A thrust piston positioned in the ball portion of the disc of a nutating disc liquid measuring device whereby the said piston

is actuated by incoming pressure to force the piston axially against a partition plate to counteract axial thrust imposed on



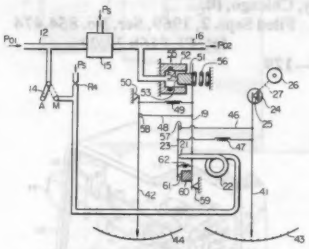
the ball and disc and also absorb any side thrust by straddling the said plate. A modified embodiment utilizes a resilient means to actuate the thrust piston.

3,698,247

AUTOMATIC-MANUAL CHANGE-OVER SWITCH CAPABLE OF PROVIDING PRESSURE INDICATION

Yoshikuni Doki, Tokyo, Japan, assignor to Honeywell Inc., Fort Washington, Pa.

Filed June 9, 1971, Ser. No. 151,227
Int. Cl. G01l 7/00
U.S. Cl. 73—388 BN **1 Claim**



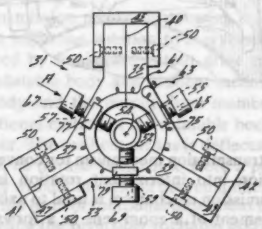
In a manual operation, the ultimate pressure at an automatic operation is stored by the position of a pointer. When the pointer is set on any desired pressure position, the back pressure of a nozzle becomes the input pressure to a pilot valve to feedback the back pressure to a beam to balance the beam.

3,698,248

PRESSURE RESPONSIVE TRANSDUCER

Anthony G. Vasek, Pontiac, Mich., assignor to The Bendix Corporation

Filed May 15, 1970, Ser. No. 37,716
Int. Cl. G01l 9/04
U.S. Cl. 73—398 AR **15 Claims**



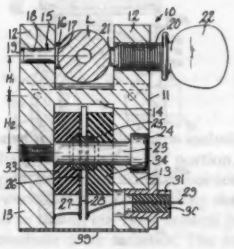
A clamp-on pressure responsive transducer for measuring changes in pressure exerted on vibrating enclosures of regular cross section by detecting changes in cross sectional area of the enclosure which are caused by pressure and distinguishing them from variations in cross sectional geometrical shape of the enclosure which are caused by vibration. A plurality of sensors are positioned around the enclosure and pressure changes cause uniform changes in each sensor while vibration causes different changes in the sensors. These changes are detected and utilized to produce an output indicative of pressure changes independently of vibration of the enclosure.

3,698,249

FLUID PRESSURE MONITORING SYSTEM

Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.

Filed Aug. 3, 1970, Ser. No. 60,429
Int. Cl. G01l 9/08
U.S. Cl. 73—398 R **39 Claims**



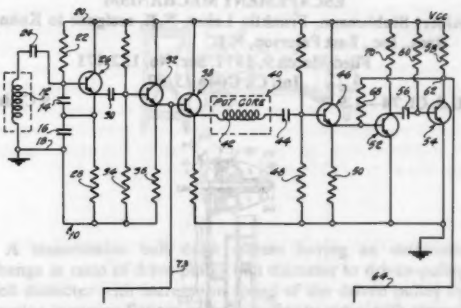
This disclosure relates to a transducing apparatus adapted to sense fluid pressure in a line by sensing expansion of the line. A transducer mounting member which is generally H-shaped defines a line receiving passage through one pair of legs and supports a transducing element between the other pair of legs. Stress applied to the mounting member by the line is detected by the transducer.

3,698,250

ELECTRONIC SENSOR FOR DEVELOPING A VOLTAGE SIGNAL PROPORTIONAL IN MAGNITUDE TO DISPLACEMENT

James I. Berry, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 13, 1970, Ser. No. 11,238
Int. Cl. G01p 15/08
U.S. Cl. 73—517 **5 Claims**



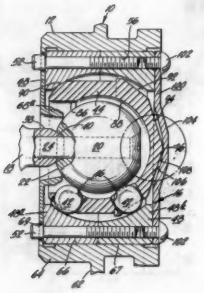
A displacement sensing electronic circuit comprising an oscillator connected to the input of a resonant circuit, said resonant circuit including an inductance element having relatively displaceable parts whereby the inductance may be changed in proportion to displacement of the parts to vary the

phase relationship between the oscillator output and the resonant circuit output, and a bistable multi-vibrator circuit adapted to receive the output signals of the oscillator and the resonant circuit, the duty cycle for the output signal for the multi-vibrator circuit being proportional to the displacement of the relatively movable parts of the inductance element.

3,698,251
THRUST RETAINER FOR SPHERICAL RACE BALL BEARINGS

Everett R. Silvia, Huntington Station, N.Y., assignor to AMBAC Industries, Inc., Garden City, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,203
Int. Cl. G01c *19/16*; F16c *31/06*
U.S. Cl. 74—5 R **13 Claims**

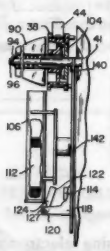


A spherical bearing assembly for gyroscopes and the like including means for minimizing the frictional effects on the ball retainer of acceleration forces. Said means includes a thrust plate on the outer bearing race having an inner spherical surface concentric with the spherical bearing surfaces and centered on the axis of rotation of the outer bearing race. An axially centered spherical portion of the retainer having a radius less than that of the spherical surface of the thrust plate is adapted to cooperatively engage the thrust plate spherical surface to transmit thereto axial components of the thrust forces substantially along the axis of rotation of the outer race. For minimizing frictional thrust forces in both axial directions, an inner face of the retainer is adapted to cooperatively engage a spherical surface of the inner ball race assembly concentric with the spherical bearing surfaces at a point on or closely adjacent the axis of rotation of the outer race.

3,698,252
ESCAPEMENT MECHANISM

Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner Bros., Inc., East Paterson, N.J.

Filed March 9, 1971, Ser. No. 122,471
Int. Cl. G04b *15/00*
U.S. Cl. 74—1.5 **9 Claims**

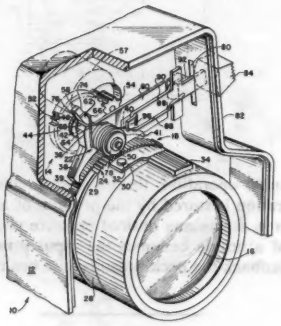


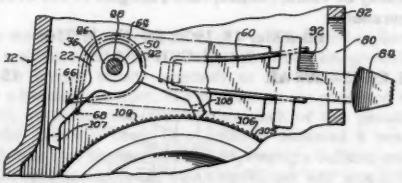
A driven mobile having a plug secured to a first shaft with a plurality of arms radially extending from the plug. Objects of interest are secured to each arm and means is provided for allowing each object to oscillate about the arm to which it is attached as said first shaft is rotated. A spring motor is provided for supplying energy for rotating the first shaft. An escapement mechanism controls the rotation of the first shaft and includes a tube that is rotatable in conjunction with the first shaft. The tube is enclosed at its ends and has a pair of magnets therein. The magnets have their south poles facing each other with the north poles diametrically opposed to each other. The magnets can move within the tube. A lever is positioned adjacent the tube bottom when the tube is vertical, is rotatable about an axis to a vertical position and includes a stop. The stop prevents rotation of the tube when the lever is in the vertical position. A magnetic means biases the lever to the vertical position. If the tube is in a vertical position with the magnets therein at the top of the tube, the lever will be in a vertical position as a result of the magnetic biasing means and the stop will prevent rotation of the tube. The magnets in the tube will descend to the bottom of the tube under the influence of gravity and the bottommost magnet overcomes the magnetic biasing means and any frictional forces and causes the lever to be moved out of its vertical position. Consequently, the tube and first shaft are free to rotate. After the tube is rotated a few degrees, the magnetic biasing means then moves the lever to a vertical position and the cycle is again repeated after the tube has come to a vertical position.

3,698,253
POWER TRANSMISSION MECHANISM

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 2, 1969, Ser. No. 854,474
Int. Cl. F16h *27/02*
U.S. Cl. 74—129 **20 Claims**





A power transmission mechanism for converting continuous rotary motion into intermittent rotation is provided. The power transmission mechanism is used to axially move at least one lens element of a zoom lens in a forward or backward direction with a smooth, uniform zooming action. The power transmission mechanism comprises a reversibly rotatable body which transmits power from a continuously rotating power

source, and has a plurality of ratchet teeth on its outer periphery. A ratchet pawl is mounted at a point spaced from the ratchet teeth of the reversibly rotatable body and is movable between an operative position where the ratchet pawl is engageable with the ratchet teeth and an inoperative position where the ratchet pawl cannot engage with the ratchet teeth. Operating means are connected to the ratchet pawl to cause the ratchet pawl to intermittently engage the ratchet teeth and rotate the reversibly rotatable body.

3,698,254

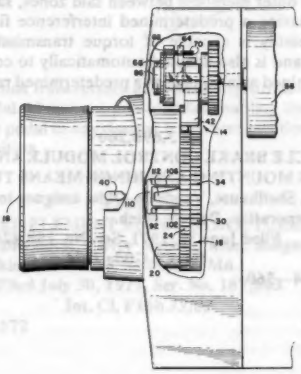
POWER TRANSMISSION MECHANISM

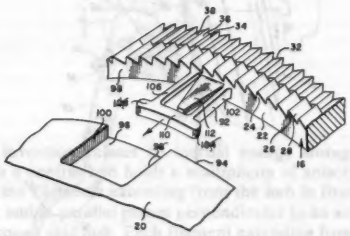
Gordon E. Bradt, Wilmette, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 2, 1969, Ser. No. 854,408

Int. Cl. F16h *27/02*

U.S. Cl. 74—143 **8 Claims**





A power transmission mechanism having a reciprocating drive means for imparting rotation to a reversibly rotatable body is improved by having an output drive member connected to the rotatable body and resilient means connecting the rotatable body and the output drive member for transmitting the rotational motion of the rotatable body to the output drive member. The resilient means is deflectable so that it can deflect from its normal position to store a portion of the rotational energy while transmitting the remainder of the rotational energy in the form of rotational movement to the output drive member while the reversibly rotatable body is rotating. The resilient means then reverts to its normal position to release the stored energy and continue moving the output drive member after the reversibly rotatable body is stopped.

3,698,255

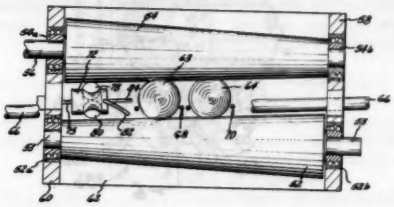
MOTION TRANSMITTING MECHANISM

Lawrence A. Schott, 15940 Warwick, Detroit, Mich.

Filed Dec. 29, 1970, Ser. No. 102,393

Int. Cl. F16h *15/16*

U.S. Cl. 74—193 **28 Claims**



A motion transmitting mechanism including a pair of spaced parallel shafts having a conical portion, each tapering in a direction opposite to the conical portion of the other shaft. The rotative movement of the driving shaft conical portion is transmitted to the driven shaft conical portion through a spherical intermediate drive member. The relative velocity of the two shafts is controlled by axial movement of the drive member along the conical portion. A reversing means including a pair of caged spherical members is further mounted normally disengaged from the shafts. Provision is made for engaging the caged spherical members into contact with the respective shafts and at the same time disengaging the first mentioned spherical drive member.

3,698,256

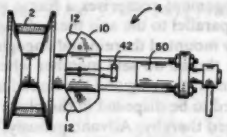
TRANSMISSION BELT-DRIVE SYSTEM

Robert V. Albertson, 2100 Shady Wood Road, Wayzata, Minn.

Filed May 13, 1970, Ser. No. 36,776

Int. Cl. F16h *55/22*

U.S. Cl. 74—230.17 E **5 Claims**



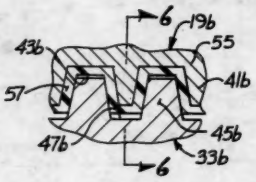
A transmission belt drive system having an automatic change in ratio of drive-pulley belt diameter to driven-pulley belt diameter with increase in speed of the driven pulley by causing opposing flanges on each pulley to move with respect to each other thereby changing the point on the diameter of each pulley at which the transmission belt operates, a bracket rigidly attached to the driving pulley and a drive belt ratio locking device mounted in the bracket for selectively limiting the distance the drive-pulley flanges can move with respect to each other thereby maintaining a constant drive belt ratio regardless of the speed which the drive pulley is rotated.

3,698,257

LEAD SCREW AND NUT

John W. Ballentine, Manhattan Beach, and Frank R. Chaffin, Thousand Oaks, both of Calif., assignors to U.S. Shamban & Co., Los Angeles, Calif.

Filed Jan. 25, 1971, Ser. No. 109,490
Int. Cl. F16h 1/18, 55/18
U.S. Cl. 74—424.8 R 16 Claims



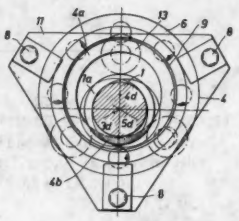
An assembly comprising a lead screw having external threads and a nut having internal threads. The nut receives the screw with the internal and external threads forming an interference fit. The threads of at least one of the nut and screw are somewhat deformable.

3,698,258

SCREW DRIVE

Robert Gartner, Freiherr v. Stein Strasse 8, 6308 Butzbach, Hessen, Germany

Filed May 27, 1971, Ser. No. 147,470
Claims priority, application Germany, May 30, 1970, P 20 26 550.3
Int. Cl. F16h 1/18, 27/02
U.S. Cl. 74—424.8 16 Claims



The specification discloses the combination of a threaded member and a nut arrangement moveable therealong in which the nut arrangement comprises a frame moveable relative to the member parallel to the axis thereof and having at least one ring rotatably mounted therein and engaging a circumferential region of the thread on said member whereby the area of interengagement of the ring and the thread is sickle shaped. The ring is inclined to be disposed in the plane of the region of the thread engaged thereby. Advantageously, more than one ring is employed with the rings spaced axially and each engaging the thread in a different circumferential region.

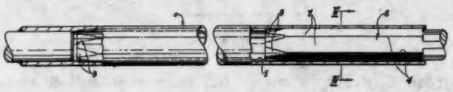
3,698,259

RELATING TO ENERGY ABSORBING SHAFTS AND METHOD OF MAKING SAME

Keith Clarkson Reeves, Frankston, Australia, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1971, Ser. No. 116,145
Claims priority, application Australia, Feb. 23, 1970, PA 0411/70
Int. Cl. B62d 1/18
U.S. Cl. 74—492 4 Claims

An energy absorbing shaft for steering motor vehicles and other purposes comprising a pair of telescopically engaged inner and outer members one of which has a plurality of circumferentially spaced and parallel edges extending lengthwise thereof and the other member has a plurality of circumferentially spaced and parallel grooves formed in zones extending lengthwise of the shaft, each of the grooves having a cross sectional formation which is substantially complementary to said edges and avoids frictional engagement between said inner and outer members between said zones, said edges and grooves having a predetermined interference fit so that the shaft assembly is capable of torque transmission in either direction and is also adapted automatically to collapse under predetermined axial impact at a predetermined rate.

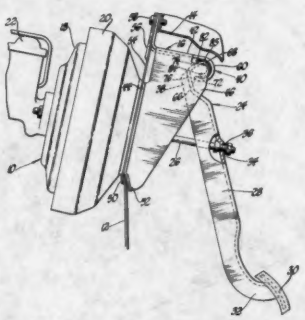


3,698,260

VEHICLE BRAKE CONTROL MODULE AND PEDAL LEVER MOUNTING AND HINGE MEANS THEREFOR

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1971, Ser. No. 158,426
Int. Cl. G05g 1/04
U.S. Cl. 74—560 9 Claims



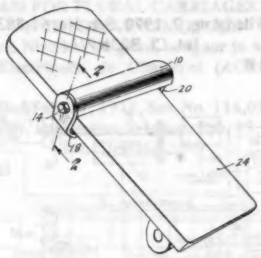
A vehicle brake control module comprising a bracket to which the brake booster and master cylinder are mounted on one side and the brake pedal lever is pivotally mounted on the other side, the pedal lever being connected to operate the booster and master cylinder when the pedal is depressed. The module is adapted to be easily installed through an aperture in a suitable vehicle panel such as the firewall, the bracket closing the aperture. The pedal lever is hinged to the bracket by a pinless hinge formed of scrolls or rolls integrally formed from the bracket and the pedal lever and arranged to permit pedal lever removal and replacement only when the pedal lever is disconnected from the booster and moved out of its usual operating range. The hinge has bushing means attached to one of the rolls and fitting between the rolls. Due to lack of space to provide reinforced pedal lever sections, the portion of the pedal lever adjacent the rolls formed thereon is arranged to be primarily in compression during at least the middle to full-stroke portion of the brake apply range of movement.

3,698,261

ACCELERATION SELECTOR UNIT FOR AUTOMOBILE ACCLEREATORS

John F. Kinney, P.O. Box 122, Humboldt, Kans.

Filed Jan. 19, 1971, Ser. No. 107,796
Int. Cl. G05g 1/16
U.S. Cl. 74—562 3 Claims



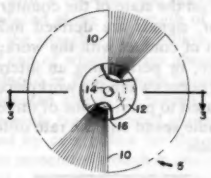
A bar extends transversely across the top surface of an accelerator pedal. Means are provided for enabling the bar to be slid along the pedal to any desired transverse position and then locked in position.

3,698,262

FIXED ELEMENT ROTOR STRUCTURES

David W. Rabenhorst, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed July 30, 1971, Ser. No. 167,643
Int. Cl. F16h 33/02
U.S. Cl. 74—572 21 Claims



The invention relates to inertial energy storage devices wherein a central hub holds a multiplicity of anisotropic filaments, the filaments extending from the hub in fixed relation thereto and in parallel planes perpendicular to an axis of rotation through said hub. Each filament extending from the central hub is so disposed within the structure that the stress component imposed on said filament acts uniaxially along its length.

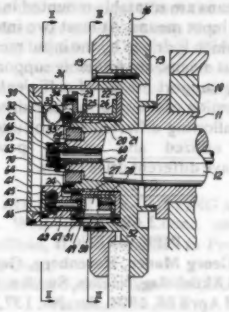
3,698,263

BALANCING APPARATUS FOR A ROTATING BODY

Teruyuki Ito, Aichi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Filed June 25, 1971, Ser. No. 156,803
Claims priority, application Japan, June 30, 1970, 45/57157
Int. Cl. F16f 15/22
U.S. Cl. 74—573 6 Claims

A balancing apparatus for a rotating body mounted on a spindle comprises a support for first and second motors being rotatably disposed on the spindle, the motors being secured on the support at diametrically opposed points relative to the spindle axis, and first and second balancing weights mounted on the support and being rotatable in annular paths thereon concentric to the spindle axis. Transmission gearing is provided for permitting the first motor to drive itself and the support thereof for rotating the support about the spindle axis and



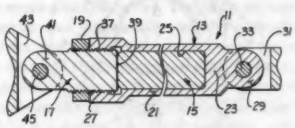
for permitting the second motor to rotate the balancing weights toward and away from each other in the annular paths of travel thereof.

3,698,264

COMPOSITE ROD

Ray A. York, Villa Park, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Dec. 28, 1970, Ser. No. 101,844
Int. Cl. F16c 7/02
U.S. Cl. 74—581 13 Claims



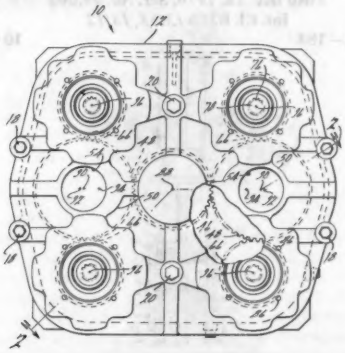
A composite rod comprising an elongated outer rod section and an inner rod section within the outer rod section. The stiffness of the inner rod section is greater than the stiffness of the outer rod section. The outer rod section is preloaded in tension and the inner rod section is preloaded in compression.

3,698,265

POWER TRANSMITTING DRIVE APPARATUS

John E. Williams, Oshkosh, Wis., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1971, Ser. No. 107,439
Int. Cl. F16h 37/06, 57/02; F01c 11/00
U.S. Cl. 74—665 GA 8 Claims



A power transmitting drive apparatus for distributing power from a single power source to a plurality of power consuming

mechanisms such as fluid pumps. The apparatus includes a housing and a positively located power input means rotatably mounted in the housing. A plurality of positively located power output means are rotatably mounted in the housing but spaced from the input means. At least two intermediate drive means, each of which is driven by the input means and drives a plurality of output means, are rotatably supported in the housing by stationary support means of sufficiently great dimensions that the location of the intermediate drive means can be varied, thereby allowing different sizes of intermediate drive means to be utilized and various power consuming mechanisms to have different drive ratios.

3,698,266

PIPE WRENCH

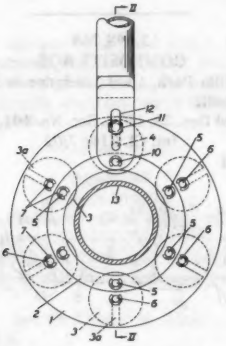
Horst Heinrich Georg Mader, Horenberg, Germany, assignor to Atlas Copco Aktiebolag, Nackas, Sweden

Filed April 26, 1971, Ser. No. 137,306

Claims priority, application Germany, April 28, 1970, P 20 20 625.1

Int. Cl. B25b *13/00, 21/02, 13/28*

U.S. Cl. 81—53 A **8 Claims**



A pipe wrench has a holder ring unit (2—2) and a dog actuating ring unit (1—1) which units are coaxial and turnable relative to each other by means of a handle (8, 9). A number of dogs (3) are pivotally mounted on bolts (5) of the holder ring unit and actuated so as to pivot into gripping positions by means of bolts (6) of the dog actuating ring unit when the handle is actuated.

3,698,267

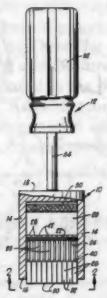
FASTENER ACTUATOR

Jon R. Denney, 437 N.W. 81st, Oklahoma City, Okla.

Filed Dec. 18, 1970, Ser. No. 99,602

Int. Cl. B25b *13/58, 13/12*

U.S. Cl. 81—185 **10 Claims**



A fastener actuator having a plurality of fastener engaging elements, each fastener engaging element being independently positionable in an engaging proximity to a fastener, the fastener engaging elements being adapted to cooperate to remove or tighten the fastener.

3,698,268

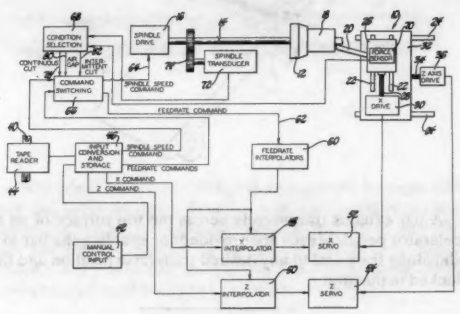
NUMERICAL CONTROL SYSTEM FOR INTERRUPTED CUTTING CONDITIONS

Hymie Cutler, Detroit, Mich., assignor to The Bendix Corporation

Filed Aug. 7, 1970, Ser. No. 61,883

Int. Cl. B23b *7/14*

U.S. Cl. 82—2 B **8 Claims**



A numerical control system for a lathe includes a transducer which generates an electrical signal proportional to the force being exerted by the cutter. This signal is compared with a preset value which is equal to the minimum force exerted by the cutter when it was in contact with the workpiece to develop an output signal which consists of a pulse occuring each time the cutter is brought into contact or goes out of contact with the workpiece. This signal is used to clear a counter which receives a pulse for each small increment of rotation of the spindle. Based on the state of the counter and the outputs of the comparator, signals are derived indicating that the cutter is either out of contact with the workpiece, in contact with the workpiece, or performing an intermittent or interrupted cut such as occurs when the workpiece is out of round. These signals are used to provide one of three levels of signals to control the spindle speed and the rate of feed of the cutter relative to the spindle.

3,698,269

MACHINE TOOLS, PARTICULARLY A DEVICE FOR BAR FEED MECHANISM AND A BAR FEED MECHANISM

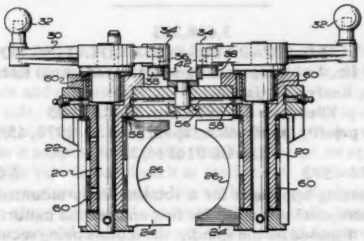
Austin Cartwright Mercer, Jr., Guiseley, England, assignor to Mercer Pneumatic Tools Limited

Filed Dec. 14, 1970, Ser. No. 97,908

Claims priority, application Great Britain, April 30, 1970, 20,806/70

Int. Cl. B23q *5/22*

U.S. Cl. 82—38 R **3 Claims**



A device is employed in conjunction with a bar stock feed mechanism for a machine tool to support the bar stock inter-

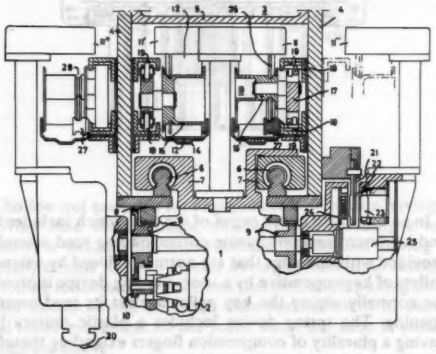
mediate its ends as the stock is rotated. The device utilizes a two part split collar whose parts are held closed by an over-center tension spring. The collar can be moved apart to a position in which the spring goes over-center and acts to hold the collar parts apart to allow the feed mechanism stock pusher to pass between the separated collar parts.

3,698,270

GUIDE BEAM FOR PLURAL CARRIAGES EQUIPPED WITH DRIVING MOTORS

Jean Gouttierre, Nivelles, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Feb. 17, 1971, Ser. No. 116,098
Claims priority, application Belgium, Feb. 19, 1970, 85535
Int. Cl. B26d *3/08*
U.S. Cl. 83—11 **8 Claims**



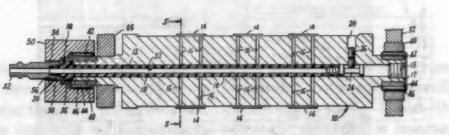
A guide beam for plural carriages including supporting rails secured to the beam, driving devices disposed along the rails each associated with a carriage and operated by a separate motor, troughs placed along the length of the beam, flexible cables placed in the troughs, and a hollow arm fixed to each carriage and the end of which moves above each trough, the flexible cables placed in each trough being inserted into the end of the arm located above the trough. The guide beam is characterized by guide tracks placed along the beam one for each carriage and by caterpillars for the cables, each being movable above its associated trough in one of the guide tracks, and supporting the end of the variable length of the cables which are inserted into the hollow arm.

3,698,271

ADJUSTABLE AIR EJECT DIE-CUTTING ASSEMBLY

Martin Kesten, West Hartford, Conn., and Ralph Bruce O'Connor, Suffield, Conn., assignor to Preston Engravers, Inc., Windsor, Conn.

Filed May 3, 1971, Ser. No. 139,395
Int. Cl. B26d *7/18*
U.S. Cl. 83—99 **8 Claims**



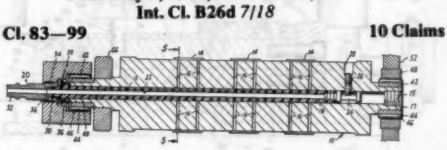
A rotary air eject die-cutting assembly utilizes an air delivery manifold having a cylindrical core portion that is closely seated within the cavity of a journaled die-cutting roll. The roll has a cutting element of closed configuration on its outside surface and an aperture that extends between the cutting element and the cavity. The core portion has an interior passageway and a generally radially extending port that is positioned for registry with the aperture of the roll, permitting air to flow through the passageway and the port, and out of the aperture,upon registry of the aperture and port. This occurs intermittently as the roll rotates about the core portion, and enables pressurized air to eject scrap that would otherwise tend to build up within the cutting element. A support member mounts the manifold and includes means for pivoting the core portion and securing it in a multiplicity of pivoted positions, permitting facile adjustment of the direction of air flow from the aperture.

3,698,272

ROTARY AIR EJECT DIE-CUTTING ASSEMBLY

Martin Kesten, West Hartford, Conn., and Ralph Bruce O'Connor, Suffield, Conn., assignor to Preston Engravers, Inc., Windsor, Conn.

Filed May 3, 1971, Ser. No. 139,378
Int. Cl. B26d *7/18*
U.S. Cl. 83—99 **10 Claims**



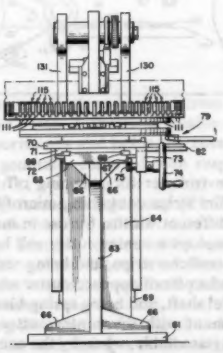
A rotary air eject die-cutting assembly utilizes an air delivery manifold having a cylindrical core portion that is fabricated of a relatively resiliently deformable material and is closely seated within the cavity of a journaled die-cutting roll. The roll has a cutting element of closed configuration on its outside surface and an aperture that extends between the cutting element and the cavity. The core portion has an interior passageway and a generally radially extending port that is positioned for registry with the aperture of the roll, permitting air to flow through the passageway and the port, and out of the aperture, upon registry of the aperture and port. This occurs intermittently as the roll rotates about the core portion which is secured in a substantially fixed position, and enables pressurized air to eject scrap that would other wise tend to build up within the cutting element. Use of a resiliently deformable core portion eliminates the need for added support and bearing members within the roll cavity; it simplifies the assembly and enhances its useful life.

3,698,273

AUTOMATIC PUNCH PRESS FOR FLEXIBLE METAL BAND

Yvon L. Richard, Sebago Lake, and Charles Wojchiwski, Portland, both of Maine, assignors to Rich Tool & Die Company

Continuation of Ser. No. 740,341, June 26, 1968, abandoned.
This application Feb. 10, 1971, Ser. No. 114,385
Int. Cl. B23d *21/14, 5/34*
U.S. Cl. 83—183 **2 Claims**



A punch press for flexible metal bands such as jet engine cooling bands which holds varying size bands in a true radius

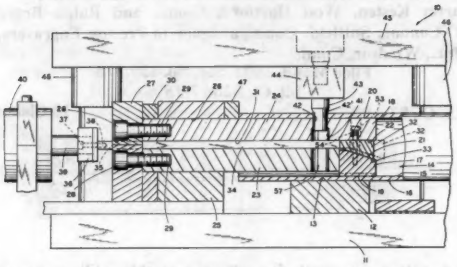
on a rotatable table angularly indexing the band past a punching head.

3,698,274

APPARATUS FOR PIERCING OPENINGS IN TUBING

Edward I. Coulon, Twin Lakes, Wis.; Benny Jay Miller, Elmhurst, and Dale C. Mohr, Addison, both of Ill., assignors to Vogel Tool and Die Corporation, Stone Park, Ill.

Filed May 14, 1971, Ser. No. 143,315
Int. Cl. B23d *21/14*
U.S. Cl. 83—188 **7 Claims**



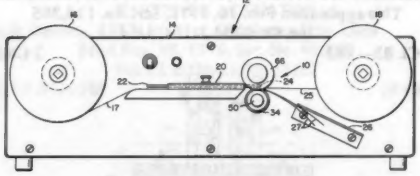
A tube piercing apparatus includes mandrel members positioned within the tube for supporting the inner wall of the tube. The tube is positioned on a supporting member having an arcuate seat. One of the mandrel members includes an inner wedge shaped surface. Wedge means is movable into engagement with the inner surface to spread the mandrel members apart against the inner wall of the tube. One of the mandrel members includes a bore and cutting edge which cooperates with a preparing punch for cutting openings in the wall of the tube.

3,698,275

VARIABLE FILM-WIDTH MICROFILM TRIMMER

Augustus W. Griswold, Rochester, and Boris W. Haritonoff, Geneseo, both of N.Y., assignors to Keystone Micro-Scan, Inc., Boston, Mass.

Filed Sept. 23, 1970, Ser. No. 74,639
Int. Cl. B23d *19/00*
U.S. Cl. 83—481 **5 Claims**



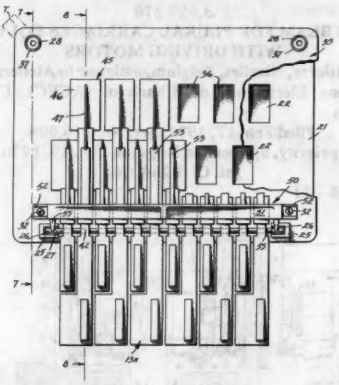
An adjustable trimmer for stripping off the unused edge portions from film strips containing microfilm images of any one of several different widths, for use in making microfiche. The trimmer employs a center cutter roll having the desired width of the microfiche strips, and being removably mounted on one shaft; and a pair of opposed cutter wheels, mounted on a second, parallel shaft, and being spring-biased toward and in cutting engagement with the center cutter roll. One of the cutter wheels is retractable, whereby the center cutter roll can be removed and replaced with another cutter roll of a different, desired width.

3,698,276

CHORD ORGANS

Harold B. Martin, Roselle, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.

Filed Dec. 3, 1970, Ser. No. 94,894
Int. Cl. G09b *15/06*
U.S. Cl. 84—365 **6 Claims**



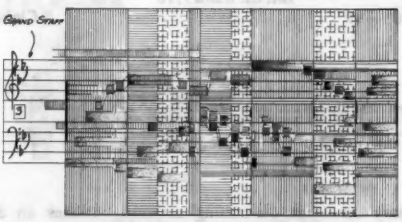
In an improved chord organ of the type which includes base and keyboard sections having corresponding reed assemblies provided with openings that are normally closed by extending pallets of keys operative by a user, a spring device is provided for normally urging the key pallet against its reed assembly opening. The spring device includes a plastic unitary body having a plurality of compression fingers extending therefrom for contact with the pallets, there being relative sliding movement between the fingers and their respective pallets during movement of the pallets between open and close positions with their reed assembly openings. The organ also features an improved gasket for each reed assembly, said gasket including a plastic unitary body which is located over the top of the reed assembly and possessing an inherent tacky surface for adhering thereto. The organ also features a tonal device which includes a single molded plastic body having a plurality of uniquely arranged pivotally mounted baffle plates located adjacent the sound slots of the organ, said plates being movable with respect to the slots to cause the tonal sounds emanating therefrom to range between a brassy and muted quality.

3,698,277

ANALOG SYSTEM OF MUSIC NOTATION

Donald P. Barra, 115 East 9th Street, New York, N.Y.

Filed May 23, 1967, Ser. No. 640,700
Int. Cl. G10b *15/00*
U.S. Cl. 84—483 **1 Claim**

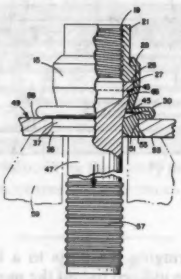


A system of musical notation in which the sound pattern constituting a musical composition is recorded essentially in visual forms which represent the duration, pitch, intensity and other significant characteristics of organized sound.

3,698,278
NUT MEMBER

William H. Trembley, Granada Hills, Calif., assignor to VSI Corporation

Filed March 15, 1971, Ser. No. 124,290
Int. Cl. F16b *13/06*
U.S. Cl. 85—70 12 Claims

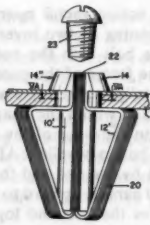


A hollow nut assembly for engagement with a plate having a receiving hole therethrough, the assembly including a nut member, a deformable sleeve affixed to the nut having a generally circular inner diameter having at least three radially protruding lobes integrally formed thereon, and a pulling stem in said sleeve having an outer diameter sufficient to cause radial outer movement of the lobes when the stem is pulled through the sleeve.

3,698,279
EXPANSION FASTENER

Emile Mallet, Paris, France, assignor to Expandet S.A., Paris, France

Filed Feb. 23, 1971, Ser. No. 118,140
Claims priority, application France, Feb. 26, 1970, 7006894
Int. Cl. F16b *13/04, 19/08, 39/28*
U.S. Cl. 85—71 7 Claims

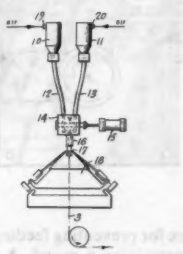


A blind fastener has an elongated body of polygonal cross-section with a plurality of longitudinally extending laterally projecting ribs formed at the corners of its sides. These ribs bite into the wall of a bore when the fastener is inserted therein. The short leg of each of a plurality of J-shaped arms is connected to the end of the fastener opposite its head and the long leg of each arm is formed with its own head so that on insertion of the fastener into the bore the short legs are bent out and the long legs lie against the blind side of a panel. The ribs are longitudinally ridged and the fastener is made of a deformable synthetic-resin material so that a screw inserted into the tubular body can expand it.

3,698,280
MANUFACTURE OF DETONATING FUSE CORD

David Martin Welsh, Brownsburg, Quebec, Canada, assignor to Canadian Safety Fuse Company Limited, Montreal, Quebec, Canada

Filed Jan. 19, 1970, Ser. No. 3,859
Claims priority, application Canada, Nov. 10, 1969, 067,150
Int. Cl. C06b *21/02*
U.S. Cl. 86—1 R 5 Claims

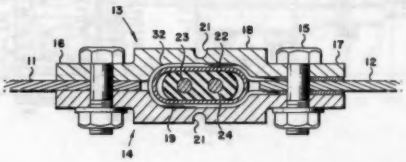


A method of manufacturing a detonating cord having a dual explosive core is described. The total quantity of explosive in the dual core varies along the length of the cord and the product is useful in metal expansion operations.

3,698,281
EXPLOSIVE SYSTEM

Oscar E. Brandt, Saratoga, Calif., and Joseph G. Harris, Dallas, Tex., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 27, 1970, Ser. No. 15,032
Int. Cl. F42b *1/00*
U.S. Cl. 89—1 B 7 Claims



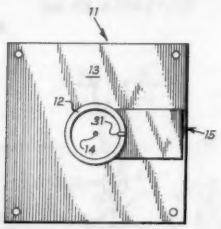
A steel tube having a flattened or oval cross section contains a pair of explosive cores. A sheath of pliable material such as silicone rubber surrounds and holds the core separated from each other and generally centered with respect to the steel tube. The rubber (1) protects the explosive cores from environmental temperature changes, and (2) absorbs the shock of detonation such that one of the cores may be detonated while the other remains undetonated as a reserve for redundancy of the system. Upon detonation of an explosive core, the steel tube expands from the flattened or oval cross section to a circular cross section; whereupon a pair of doublers enclosing the tube are fractured and separated along a weakened section underlying a notch or groove which extends longitudinally along a doubler joint and along the steel tube.

3,698,282

MORTAR SAFETY DEVICE FOR PREVENTING DOUBLE LOADING

Zigmund M. Albatys, Louisville, Ky., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 23, 1971, Ser. No. 155,990
Int. Cl. F41f 1/06
U.S. Cl. 89—1 F **6 Claims**



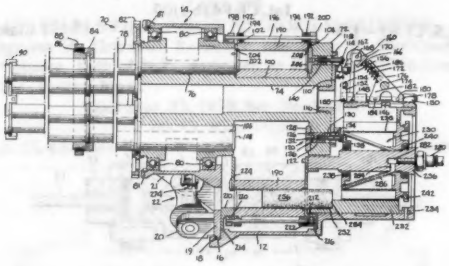
A safety device for preventing feeding a mortar round into a barrel already containing a round. A tripping arm of a bell crank extends into the barrel of a mortar and permits one mortar round to enter the barrel. The tripping arm then locks to prevent a second round from entering the barrel. The firing of the first round unlocks the tripping arm to permit a subsequent firing of the mortar.

3,698,283

MULTIBARREL AUTOMATIC WEAPON

Eugene Ashley, Burlington; Douglas P. Tassie, St. George, and James M. Seemann, South Burlington, all of Vt., assignors to General Electric Company

Filed March 10, 1970, Ser. No. 18,031
Int. Cl. F41d 7/02
U.S. Cl. 89—12 **4 Claims**



A gun having at least a barrel, at least a chamber and means for moving said chamber transversely to said barrel from a noncoaxial feed station to a coaxial lock and fire station, and means including a stationary cam surface for progressively chambering a cartridge in said chamber as it moves from said feed station to said lock and fire station.

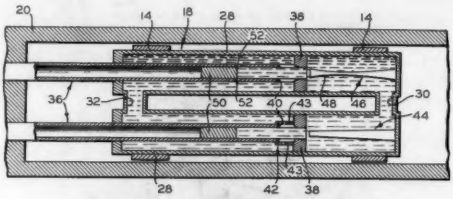
3,698,284

BUFFER SYSTEM FOR DECELERATING A RECIPROCATING GUN

Robert J. Toering, Moline, Ill., and Robert E. Seamands, Bettendorf, Iowa, assignors to The United States of America as represented by the Secretary of the Army

Filed July 16, 1970, Ser. No. 55,497
Int. Cl. F41f 19/02
U.S. Cl. 89—43 R **9 Claims**

In a recoil mechanism for a large caliber gun wherein an elongated tapered control rod is fixed in each of a pair of cylinders filled with oil and mounted to the moving parts of the gun for respective slidable engagement with a pair of hollow pistons fixed to a stationary part of the gun and is arranged to enter into the respective pistons during the recoil travel of the moving parts to progressively restrict the flow of fluid



therethrough for bringing the parts to a halt, the foregoing structure can also be utilized to halt the moving parts during a portion of the counter-recoil movement thereof simply by providing one of the control rods with a reverse tapered end portion arranged to enter the associated hollow piston with a minimum clearance.

3,698,285

TOGGLE ACTION FIREARM

Gary Wilhelm, Hamden, Conn., assignor to Stoeger Arms Corporation, South Hackensack, N.J.

Division of Ser. No. 766,380, Oct. 7, 1968, Pat. No. 3,614,908.
This application April 15, 1971, Ser. No. 90,224
Int. Cl. F41d 3/02
U.S. Cl. 89—189 **3 Claims**

Shown in a toggle action recoil operated semiautomatic pistol is a toggle consisting of two inverted channel shaped arms that straddle the bolt with the outer end of one arm pivotally secured to the frame of the pistol and the outer end of the other arm pivotally secured to the bolt. The arms are joined by a link pin fixed within the channel of the rear arm and slidable in a slot in the sides of the front arm. The rear upper shoulder of the bolt is bevelled. After the bolt recoils a short distance defined by the slot and the link pin, the bevel strikes the link pin and cams it upward to fold the toggle arms. A recoil spring restores the bolt and toggle to their original positions.

3,698,286

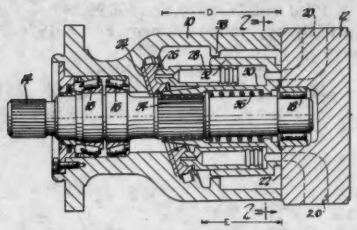
POWER TRANSMISSION

Gaylord O. Ellis, Rochester, and John A. Halat, Troy, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed June 28, 1971, Ser. No. 157,511
Int. Cl. F01b 3/00
U.S. Cl. 91—486 **3 Claims**

A hydraulic pump or motor of the axial piston type having a cylinder barrel rotating against a fixed valve plate perpendicular to the shaft and free to find its own seat against the valve plate has an improved casing which produces a non-uniform velocity in the fluid circulating by frictional drag of the cylinder barrel. This produces Bernouli effects which react

upon the sides of the cylinder barrel and conteract the Bernouli effects acting on the back end face of the cylinder



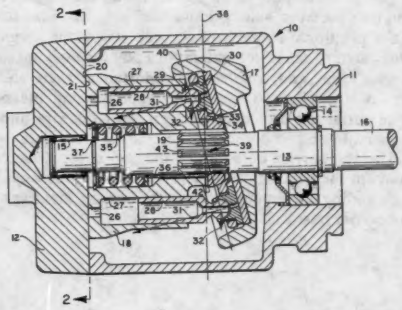
barrel which are produced by the rotary motion of the projecting pistons. This increases the maximum speed at which the unit can operate.

3,698,287

AXIAL PISTON DEVICE

Robert J. Martin, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Dec. 9, 1970, Ser. No. 96,451
Int. Cl. F01b *3/00, 13/04*
U.S. Cl. 91—507 **8 Claims**



An improved manner of supporting the cylinder barrel against side or transverse loads utilizing a flat, uncrowned spline driving connection between the drive shaft and cylinder barrel. The unit is constructed so that the side load imposed on the cylinder barrel and shaft acts at the outer edge of the cylinder barrel. By controlling design parameters such as shaft selection and bearing location, the point of maximum shaft deflection is maintained at a location within the axial length of the cylinder barrel to maintain alignment of the side load and its support during shaft deflection to prevent tilting of the cylinder barrel.

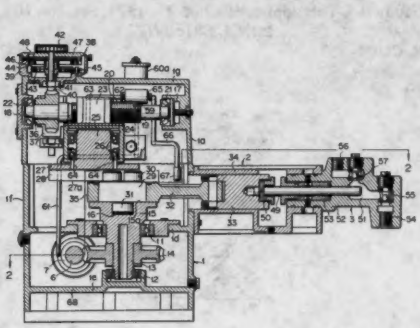
3,698,288

VARIABLE METERING PUMP

Kiyomi Sonobe, Saitama, Japan, assignor to Iwaki Co., Ltd., Tokyo, Japan

Filed July 6, 1971, Ser. No. 159,593
Claims priority, application Japan, July 16, 1970, 45/61985; Aug. 18, 1970, 45/81759
Int. Cl. F01b *31/14*
U.S. Cl. 92—13.4 **8 Claims**

A variable metering pump comprising a plunger type pump unit; a reciprocating mechanism for reciprocating the plunger thereof consisting of a connecting rod and an Oldham coupling; a device for adjusting the stroke of the plunger; and a lubricating system for lubricating the sliding portions of the plunger, wherein adjustment by said device can vary the capacity of the pump during operation and the forward end of



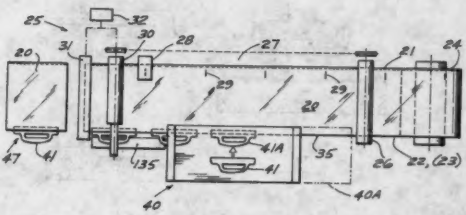
the reciprocating plunger always stops in the forward stroke at a fixed point in a pump chamber, no matter how the plunger stroke is changed.

3,698,289

APPARATUS FOR AUTOMATIC MANUFACTURE OF HANDLE BAGS

Seymour Kamins, Oceanside; Norman Rosenberg, Bayside, and Per Bentsen, Bronx, all of N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,659
Int. Cl. B31b *1/86, 1/20, 1/72*
U.S. Cl. 93—8 WA **5 Claims**

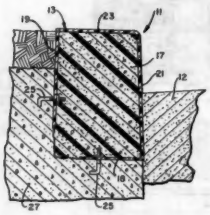


Apparatus for the automatic manufacture of thermoplastic carrier bags of the type formed of thin film of thermoplastic material and having a thermoplastic handle and closure means secured to the inner walls of the bag at its mouth. The machine includes apparatus for transporting a double layer bag blank of thermoplastic material, inserting a combined handle and closure means into the open edge of the blank and heat sealing each side thereof to a respective wall of the blank. Thereafter, the bag blank, with handle and closure means attached thereto, is transported to a further station at which a combined sealing and cutting operation occurs to form separate bags whose side edges are now sealed. A magazine is provided for storing a plurality of such handle and closure means and means is provided for feeding one at a time into the bag blank. The apparatus includes means for adjusting in a plurality of different ways the position of each handle and closure means as it is fed into the bag blank.

3,698,290
STREET CURBINGS MADE OF SYNTHETIC RESINS

Robert J. Wallace, 6502 Westland Road, Bethesda, Md.

Continuation-in-part of Ser. No. 830,700, June 5, 1969, abandoned. This application Jan. 21, 1971, Ser. No. 108,578
Int. Cl. E01c *11/22*
U.S. Cl. 94—31 6 Claims

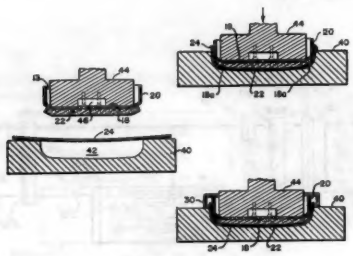


A street curbing comprising an outer polyethylene shell reinforced with fiberglass. The shell is filled with high density polyethylene foam.

3,698,291
METHOD OF FABRICATING A COVERED BOX CONSTRUCTION

George G. Bergh, and Robert G. Bergh, both of Attleboro, Mass., assignors to Bergh Bros. Co., Inc., Attleboro Falls, Mass.

Division of Ser. No. 755,617, Aug. 27, 1969, Pat. No. 3,553,822, which is a division of Ser. No. 705,836, Feb. 15, 1968, Pat. No. 3,426,938. This application Aug. 5, 1970, Ser. No. 61,472The portion of the term of this patent subsequent to Jan. 12, 1988, has been disclaimed.
Int. Cl. B31b *15/00*
U.S. Cl. 93—54 R 3 Claims



A method of fabricating a decoratively covered box component of the type having a bottom member with a continuous wall member extending vertically from the peripheral edge thereof. The method includes the steps of covering the bottom member and at least a portion of the wall member with a blank of cloth, paper or similar flexible sheet material. While the sheet material is held in a taut condition, a rim member is employed in cooperation with the wall member to hold the sheet material in place, the exposed surfaces of the latter thereafter remaining taut and movable relative to the box component surfaces over which it extends.

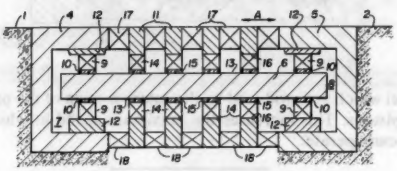
ERRATUM

For Class 94—31 see:
Patent No. 3,698,290

3,698,292
EXPANSION GAP SEALING DEVICE

Waldemar Koester, Forsbach, Germany, assignor to Firma Friedrich Maurer Soehne, Munich, Germany

Filed Dec. 21, 1970, Ser. No. 99,897
Claims priority, application Germany, Feb. 3, 1970, P 20 04 634.8; March 24, 1970, P 20 13 938.2
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 15 Claims

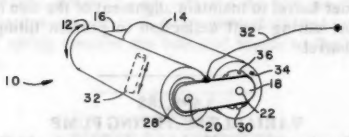


The present sealing device relates to an expansion gap. Such gaps are maintained between adjacent construction members, for example, slabs of concrete forming the roadbed on bridges or the like. A plurality of gap strips are inserted into such gaps and sealing means of elastic material are inserted between adjacent gap strips or between a gap strip and the edges of the construction member which define the gap. In order to improve the positional stability of the gap strips, the invention provides carrier bars which extend directly through apertures in the gap strips and which are supported at their ends in recesses of the edges defining the gap. Bearing means of elastic material are provided between the gap strips and the carrier bars. In one embodiment the bearing means are firmly secured to the carrier bars and to the gap strips. In another embodiment the bearing means comprise the glide pieces permitting a gliding movement between the bearing means proper and the carrier bars.

3,698,293
CONCRETE FINISHING APPARATUS

Jacob C. Wagner, P.O. Box 133 New Castle, New Castle, Del.

Filed March 2, 1971, Ser. No. 120,272
Int. Cl. E01c *19/28*
U.S. Cl. 94—50 1 Claim



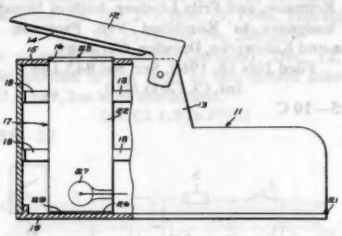
A concrete compacting, screeding, and trowelling machine comprising a pair of rollers mounted in tandem by plates at the ends of the rollers, one or both rollers having powered internal vibrators, one or both rollers having a motor providing tractive effort for moving the machine, one of the rollers having a rotation preventor so that it can be dragged by the other roller as a screed, and one or both rollers having a petcock allowing the interior to be filled with fluid.

3,698,294

SENSITOMETER APPARATUS

Lloyd C. Sanford, Acton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed April 1, 1968, Ser. No. 717,870
Int. Cl. G01j 1/10, 1/40, 3/10
U.S. Cl. 95—1 13 Claims



A sensitometer having a replaceable integral exposure source unit including both a constant source of actinic energy and an energy modulator. Because of the fixed relationship between its individual components, the modulated energy output remains at a known, constant level over the life of the exposure unit.

3,698,295

METHOD FOR MORE BRILLIANT COLOR PICTURE PRESENTATION

Earl C. Van Swearingen, 5714 Driftwood Parkway, Cape Coral, Fla.

Continuation of Ser. No. 614,404, Feb. 17, 1967, Continuation of Ser. No. 662,560, Aug. 3, 1967. This application Feb. 13, 1969, Ser. No. 799,122
Int. Cl. G09f 13/20, 7/00
U.S. Cl. 95—1 9 Claims

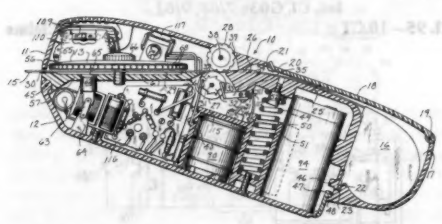
Method of reproducing individual pictures or multiples thereof. A non-luminescent surface is placed next to a background light reflecting surface and next to the non-luminescent surface a daylight activated fluorescent surface is placed. At certain points on the picture a lighter surface is provided so as to be able to peek through and highlight a darker surface.

3,698,296

ACTINIC LABEL-MAKING TOOL

Elliott G. Heuser, Mequon, and William H. Muttera, Jr., Whitefish Bay, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Sept. 29, 1969, Ser. No. 861,846
Int. Cl. B41t 19/00
U.S. Cl. 95—4.5 9 Claims



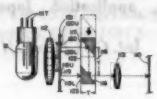
A label-making tool utilizing an ultraviolet light system and including: a supply of tape material having an ultraviolet-imaging coating, means to incrementally advance the tape material past an exposure station, rotatable type means for selectively positioning a character at the exposure station, and ultraviolet light means adapted to emit u.v. light to produce an image of the character positioned at the exposure station in the ultraviolet-imaging coating of the tape material.

3,698,297

PRISMATIC FONT ACCESSING IN PHOTOTYPESETTERS

Robert B. Herden, Webster, N.Y., assignor to The Singer Company

Filed March 18, 1971, Ser. No. 125,747
Int. Cl. B41b 13/00
U.S. Cl. 95—4.5 R 6 Claims



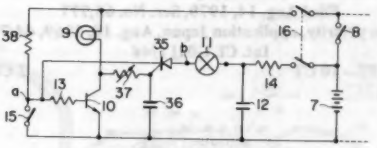
An optical system for a phototypesetting machine wherein a rotating type font having at least two spaced apart rows of characters has a focused light source periodically pulsed to direct a light beam through a translucent character in each of the two rows. An optical path for each of the character images is provided through a fixed projection lens onto a predetermined portion of a photosensitive medium. A rhomboid optic element having a predetermined index of refraction is selectively interposed in either of two positions in the optical paths of the character images. In one position, the first character is blocked and light from the second character passes through the prismatic element and is sharply focused by the projection lens on the photosensitive medium. In the alternate position, the second character is blocked and light from the first character is allowed to pass directly into the projection lens to also form a sharply focused image on the medium without passing through the rhomboid element.

3,698,298

FLASH PHOTOGRAPHIC DEVICE FOR AUTOMATIC EXPOSURE CONTROL CAMERAS

Tomio Kikuchi; Hiroshi Yamaguchi, both of Tokorozawa, and Kiyoyuki Arai, Gyoda, all of Japan, assignors to Kabushiki Kaisha, Koparu, Japan

Filed March 12, 1970, Ser. No. 19,047
Claims priority, application Japan, March 14, 1969, 44/19381
Int. Cl. G01j 1/44
U.S. Cl. 95—10 CE 8 Claims



A camera equipped with an electronic shutter operative so that the intensity of the scene illumination is detected by a photoconductive cell and that the electronic automatic exposure control circuit containing said photoconductive cell is actuated in accordance with the amount of illumination thus detected and that, as a result, the electromagnet connected to said circuit is caused to effectuate the action of closing the shutter blades. An illuminant is provided opposite to said photoconductive cell so that, in case flash photograph is taken, said illuminant is lighted in the stage of the release of the shutter mechanism of the camera. Therefore, prior to

being subjected to the reflected light from the scene illuminated by a flash bulb, the photoconductive cell is preliminarily exposed directly to the irradiation from the illuminant.

3,698,299

ELECTRONIC SHUTTER FOR PHOTOGRAPHIC CAMERA EQUIPPED WITH EXPOSURE CONDITION CHECKING CIRCUIT AND EXPOSURE TIME CONTROL CIRCUIT

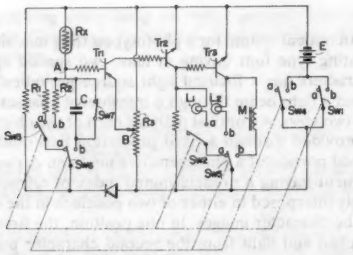
Kunio Arisaka, Tokyo, and Toshikazu Takizawa, Saitama, both of Japan, assignors to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Sept. 14, 1970, Ser. No. 71,769

Claims priority, application Japan, Sept. 19, 1969, 44/89248

Int. Cl. G03b 17/18

U.S. Cl. 95—10 CT **1 Claim**



An electronic shutter for a photographic camera having electronic circuitry including an exposure-condition checking circuit and an exposure-time control circuit. These circuits are arranged so that, upon depression of the release button of the camera, the power switch of said electronic circuitry is closed first to connect the checking circuit to the power source by a changeover switch. A further depression of the button causes said changeover switch to be switched from said checking circuit to the exposure time control circuit. Finally, the shutter operating mechanism is released by said button. Throughout the exposure effected by the shutter, both the power switch and the changeover switch are held locked at the position in which said exposure time control circuit is formed by the shutter operating members.

3,698,300

ELECTRIC SHUTTER MECHANISM FOR A CAMERA

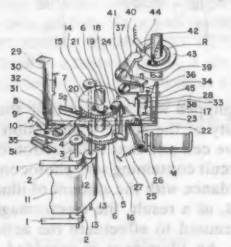
Toshio Kobori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1970, Ser. No. 63,777

Claims priority, application Japan, Aug. 18, 1969, 44/78321

Int. Cl. G01j 1/44

U.S. Cl. 95—10 CT **2 Claims**



In an electric shutter mechanism for a camera the shutter is retained in a cocked position and held there by an operating member when exposure time setting is set for a bulb exposure so as to reduce the power consumed from the battery in maintaining energization of the circuitry normally retaining the shutter in a cocked position.

3,698,301

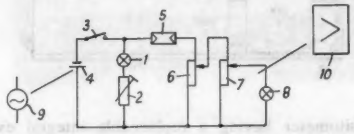
APPARATUS FOR METERLESS EXPOSURE VALUE INDICATION

Hubertus Reimann, and Fritz Lindner, both of Dresden, Germany, assignors to Kombinat Veb Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

Filed July 18, 1969, Ser. No. 843,148

Int. Cl. G01j 1/10

U.S. Cl. 95—10 C **1 Claim**



An exposure measuring apparatus has a lighting element which can be connected to and influenced by a source of supply potential. Means are provided for presetting the light emission of the lighting element. A photo-sensitive receiver influenced by prevailing light conditions is connectable with the source of supply potential and influences the light emission of a second lighting element which is connected in circuit with the photo-sensitive receiver and at least one resistance attenuation element. The resistance attenuation element or elements are adapted to adjust the light emission of the second lighting element in accordance with required exposure factors when the supply potential is connected. The lighting elements are formed as light source pillars the color of which are influenced by their supply frequency, e.g. electro luminescent plates. The source of supply potential is an alternating current source and the second lighting element is connected therewith via a variable frequency generator the frequency of which is influenced by the setting of the resistance attenuation elements. The first and second lighting elements are arranged to illuminate respective surfaces positioned immediately adjacent one another whereby when the color and brightness of each of the surfaces is equal, the exposure factors are set to values required for accurate exposure.

3,698,302

CIRCUIT FOR PREVENTING FALSE OPERATION OF AN ELECTRONIC CAMERA SHUTTER

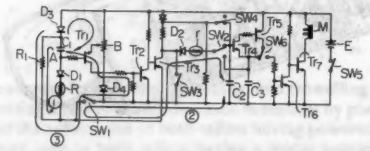
Takayoshi Sato, Tokyo, Japan, assignor to Kabushikikaisha Copal, Tokyo, Japan

Filed Oct. 29, 1970, Ser. No. 85,210

Claims priority, application Japan, Nov. 14, 1969, 44/108771

Int. Cl. G03b 7/08, 9/62

U.S. Cl. 95—10 CT **3 Claims**



A circuit for preventing false operation of an electronic shutter includes a diode connected in the R-C circuit of the light integrating portion of the circuit which diode inhibits un-

timely discharge of the integrating capacitor in the presence of undesired contact chatter in the switching means associated with the circuit.

3,698,303

PHOTOGRAPHIC FILM PACK

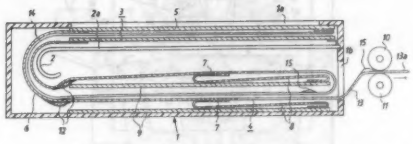
Hans-Peter Huber, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 785,277, Dec. 19, 1968. This application Dec. 15, 1971, Ser. No. 208,059

Claims priority, application Germany, Dec. 12, 1967, A 57781The portion of the term of this patent subsequent to March 21, 1989, has been disclaimed.

Int. Cl. G03b *17/52*

U.S. Cl. 95—22 **10 Claims**



Successive film units which are stored in the container of a photographic film pack for use in a camera which develops the film are connected to each other by flexible coupling strips each of which automatically passes between the pressure applying rolls of the camera in response to withdrawal of the preceding film unit. The leading ends of coupling strips are weakened so that they can be readily separated from preceding film units. Such separation is further facilitated by transversely extending or inclined beads provided on the coupling strips and engaging with the pressure applying rolls during separation of respective coupling strips from the preceding film units.

3,698,304

SHUTTER RELEASE CONTROL MECHANISM

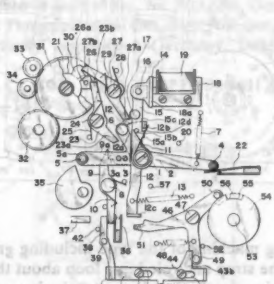
Shohei Tenkumo, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed March 3, 1970, Ser. No. 16,010

Claims priority, application Japan, March 6, 1969, 44/19502; March 10, 1969, 44/20631; March 10, 1969, 44/20632

Int. Cl. G03b *9/08*

U.S. Cl. 95—53 EB **7 Claims**



An electrically controlled shutter mechanism has a shutter closing member movable between a cocked and a rest position with an armature actuated by an electromagnet controlled by an electric timing circuit for holding the shutter closing member in the cocked position. A mechanism engages the shutter closing member and biases it in the rest position and additional structure moves the shutter closing member to the cocked position and moves the armature into contact with the electromagnet. The aforesaid mechanism is moved by the shutter opening member to cock the aforesaid additional structure while the armature engages the electromagnet so as to cause the armature to be pressed against the electromagnet with the shutter opening member locked in the cocked position.

3,698,305

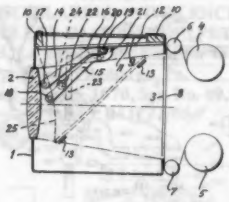
VIEWFINDER MIRROR MECHANISM FOR SINGLE-LENS REFLEX

Alf Ingva Alfredsson, Savedalen, Sweden, assignor to Dr. Fritz Victor Hasselblad, Goteborg, Sweden

Filed Dec. 10, 1970, Ser. No. 96,742

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **2 Claims**



A viewfinder mirror mechanism for one-piece, single-lens reflex cameras in which three or four arms have one end pivotally attached to the sides of the camera and their other ends pivotally attached to lateral edges of the mirror and the pivot points are selected so that movement of the mirror between a folded-down and a folded-up position causes the edge of the mirror adjacent the lens to describe an extended S-shaped curve which curves away from the lens until the mirror clears the lens area and then curves toward the lens in the area above the lens area.

3,698,306

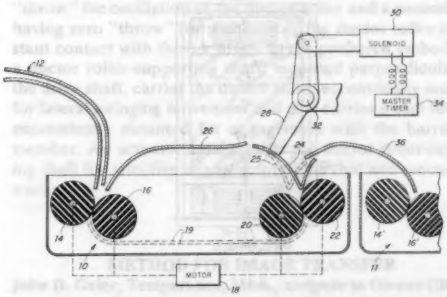
PHOTOGRAPHIC PROCESSOR

Henry N. Fairbanks, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed June 10, 1971, Ser. No. 151,635

Int. Cl. G03d *3/12*

U.S. Cl. 95—94 **9 Claims**



A photographic processing unit in which an increased amount of processing time in one processing station of the unit is attained by recycling the photographic materials through that processing station. Recycling is achieved by providing a movable two position deflector at the exit of the processing station. The deflector is movable to a first position in which it

deflects the photographic materials existing from that processing station back to the entrance for one or more further cycles through the processing station. After the photographic materials have been recycled a sufficient number of times to allow complete chemical treatment, the deflector is moved to a second position wherein it deflects the photographic materials to the next processing station of the unit wherein the same type of recycling may be utilized if so desired.

3,698,307

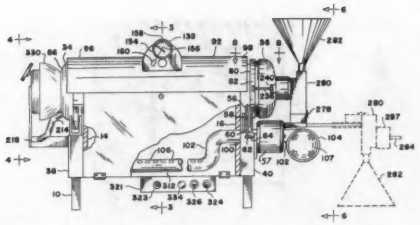
PHOTOGRAPHIC PRINT AND FILM PROCESSING MACHINE

Theodore A. Reichardt, 4501 East 8th Street, Tucson, Ariz.

Continuation-in-part of Ser. No. 64,285, Aug. 17, 1970, abandoned. This application Feb. 19, 1971, Ser. No. 116,870

Int. Cl. G03d *3/08*

U.S. Cl. 95—93 **17 Claims**



A photographic print and film processing apparatus having a housing adapted for holding a plurality of chemicals containers; a processing drum rotatable relative to said housing; a convective heating and cooling device for maintaining said containers and said drum substantially at a desirable temperature; and thermostatic elements for controlling said convective device whereby the temperature of chemicals in said containers and said drum are maintained compatible to the successive use of said chemicals in said drum for processing sensitized materials.

3,698,308

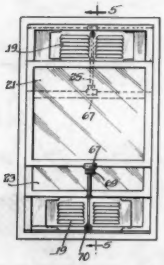
FILTER SYSTEM FOR WINDOWS

Joseph Navara, 2105 West Walton Street, Chicago, Ill.

Filed May 28, 1970, Ser. No. 41,191

Int. Cl. E06b *7/08*

U.S. Cl. 98—99 R **1 Claim**



A window filter system providing filter means positionable in window frames adjacent opened windows for providing a cooling air flow to the associated room. Filter units are provided at both the top and bottom of the window frame to provide air circulation.

The system is a passive system in that no mechanical parts are utilized for blowing air in or out of the room.

3,698,309

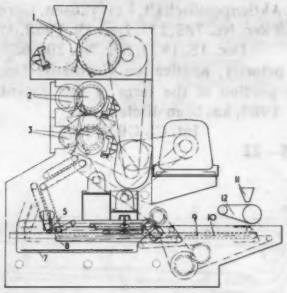
DOUGH LAMINATING

Gordon Steels, Peterborough, England, assignor to Baker Perkins Limited, Peterborough, England

Filed Nov. 20, 1970, Ser. No. 91,382

Int. Cl. A21c

U.S. Cl. 99—450.1 **7 Claims**



In a method and apparatus for laminating bakery dough in the manufacture of crackers for example a continuously moving peeler conveyor band is caused to reciprocate with a reciprocatory laminating device for the purpose of depositing an additive such as fat/flour dust between the dough laminations the speed of the conveyor band relative to the speed of the laminating device being such that the additive is discharged from the conveyor during movement of the laminating device in one direction only.

3,698,310

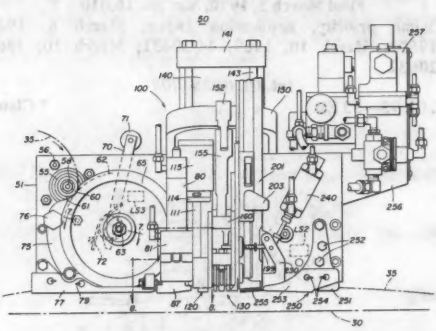
STRAPPING MACHINE

Robert F. Plattner, Chicago Heights, and James A. Kocian, Evergreen Park, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Jan. 18, 1971, Ser. No. 107,269

Int. Cl. B65b *13/34*

U.S. Cl. 100—4 **20 Claims**



A strapping machine of the type including gripping means for holding the strap encircled in a loop about the object, seal feed mechanism, gathering jaws, tensioning means, sealing jaws, crimping die members and a shear blade, also comprises a single air-actuated piston adapted for reciprocating movement in directions substantially normal to the plane of the strap in the sealing region, the piston driving a crosshead having cam surfaces and abutment surfaces thereon respectively operative to produce substantially simultaneously a cammed movement of the sealing jaws to their sealing configuration, movement of the die members to their crimping position, movement of the shear blade to its shearing position and open-

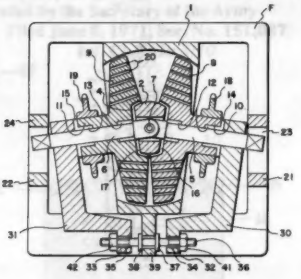
ing of the gathering jaws, all during a single stroke of the crosshead; novel linkage for coupling the piston to the crosshead is also disclosed.

3,698,311

APPARATUS FOR CONTINUOUS DEHYDRATION

Ryutaro Yoritomi, 5-17-12 Koishikawa, Bunkyo-ku, Tokyo, Japan

Filed Nov. 30, 1970, Ser. No. 93,562
Claims priority, application Japan, Dec. 6, 1969, 44/97534
Int. Cl. B30b *3/04*
U.S. Cl. 100—158 C **10 Claims**



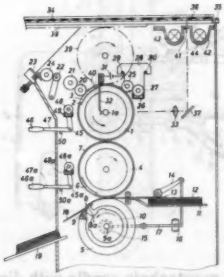
A dehydrating apparatus having facially opposed filter discs mounted angularly for rotation on the inner ends of two fixed supporting shafts. The inner tip ends of the supporting shafts are joined for pivotal movement by a pin assembly which is supported by an arm plate integrated with the apparatus' outer annular casing. The outer ends of the shaft are supported for movement in a horizontal plane by guides carried by the apparatus' side plates. Connecting levers integrally formed with the outer ends of the supporting shafts extend to the outer periphery of the outer annular casing. The free ends of the connecting levers connected by an adjustable connecting rod which permits the space between the filter discs to be varied. In one embodiment the adjustable connecting rod is provided with a resilient member to permit the space between the filter discs to be increased if the pressing force therebetween becomes too great.

3,698,312

ROTARY PLANOGRAPHIC PRINTING PRESS

Rodolf Muller, Deisenhofen, Germany, assignor to Agfa-Gevaert, Mortsel, Belgium

Continuation-in-part of Ser. No. 503,696, Oct. 23, 1965, abandoned. This application Oct. 31, 1969, Ser. No. 873,028
Claims priority, application Germany, Dec. 15, 1964, A 47884
Int. Cl. G03b *27/12*; G03f *7/10*; B41l *25/00*
U.S. Cl. 101—142 **7 Claims**



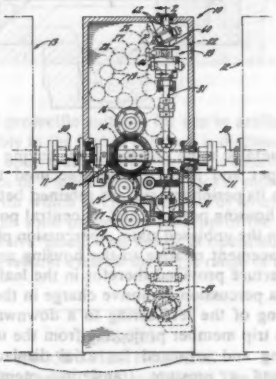
A rotary planographic printing press wherein a hydrophobic photoconductive recording layer carried on the printing cylinder of the press is exposed to acquire a latent photoconductive image of the information to be printed and is then developed by means of an aqueous conductive developing liquid applied to the photoconductive recording layer under an external electrical field of such a polarity as to attract such liquid differentially into wetting relation with the recording layer surface in accordance with the exposed image thereon, a hydrophobic planographic printing ink is applied to the thus selectively wetted recording layer so as to adhere selectively to the unwetted areas of the recording layer while being repelled from the wetted areas thereof, and the ink image thus obtained is printed onto a copy sheet fed to the press. Preferably the press includes an off-set cylinder operating in conjunction with an impression cylinder. Preferably, the aqueous developing liquid and the hydrophobic printing ink are applied by means of a common applicator roller onto which is applied a fine screen pattern of the ink and in the uninked open areas the aqueous developing liquid is applied.

3,698,313

MEANS FOR OSCILLATING AND SILENCING A DUCTOR ROLLER IN A PRINTING PRESS

Leonard I. Tafel, La Orange, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 25, 1970, Ser. No. 49,587
Int. Cl. B41f *31/06*
U.S. Cl. 101—350 **3 Claims**



A mechanism for selectively oscillating the ductor roller of a printing press wherein a barrel cam, mounted on a drive shaft, has a first cam track which is ramped to provide "throw" for oscillation of the ductor roller and a second track having zero "throw" for maintaining the ductor roller in constant contact with the ink drum. In the preferred embodiment a ductor roller-supporting shaft, mounted perpendicularly to the drive shaft, carries the ductor roller eccentrically mounted for lateral swinging movement and also carries a cam follower eccentrically mounted for engagement with the barrel cam member. An actuator axially shifts the ductor roller-supporting shaft for selective engagement of the first and second cam tracks.

3,698,314

METHOD FOR IMAGE TRANSFER

John D. Grier, Temperance, Mich., assignor to Owens-Illinois

Filed June 15, 1970, Ser. No. 46,063
Int. Cl. B41c *3/08*
U.S. Cl. 101—426 **1 Claim**

A method and apparatus for image transfer in an electrophotography printing system wherein the removal of solid particulate toner in the form of an image on an image-defining element is accomplished by contacting the toner with a heated

transfer roll. The portion of the toner directly contacted by the heated transfer roll softens and interparticle adhesion is increased by the combination of heat and pressure applied by the heated transfer roll. Simultaneously, the portion of the toner directly on the image-defining element becomes relatively less adherent to the surface of the image-defining element to thereby facilitate its transfer from the image-defining element to the heated transfer roll.

3,698,315

NON-METALLIC MINE PRESSURE FUSE

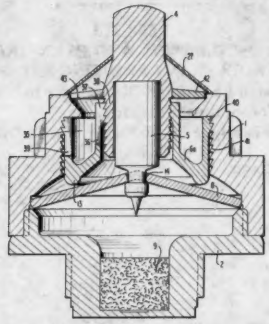
Franz Becker, Bonn, Germany, assignor to Dyamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 13, 1969, Ser. No. 833,025

Claims priority, application Germany, Aug. 1, 1968, P 17 71 935.6

Int. Cl. F42b *23/28*

U.S. Cl. 102—8 **9 Claims**



A non-metallic mine pressure fuse, having a housing comprising upper and lower portions secured together, a leaf spring with its peripheral surface retained between the upper and lower housing portions and its central portion projecting upwardly in the unbiased state, a percussion pin supported for axial displacement relative to the housing and retained at a central aperture provided therefor in the leaf spring so as to penetrate a percussion explosive charge in the lower housing upon flexing of the leaf spring to a downwardly projecting position, a trip member projecting from the upper surface of the housing and arranged for axial displacement relative thereto, and a pressure translating member interposed between the trip member and the leaf spring to cause a downward flexing of the spring upon an external pressure in excess of a predetermined value applied to the trip member, wherein detent means are provided to prevent restoration of the pressure translating member to its initial position prior to the exertion of a pressure of lesser magnitude than the predetermined value.

3,698,316

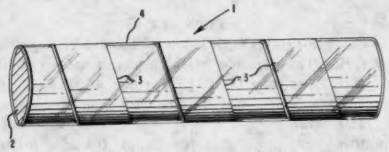
DETONATING FUSE OF PETN-POLYETHYLACRYLATE

William L. Evans, Blackwood, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1970, Ser. No. 99,474

Int. Cl. F42b *1/00*

U.S. Cl. 102—27 **14 Claims**



A detonating fuse having an inert flexible core, and wound around said core a strip of explosive composition comprising particulate pentaerythritol tetranitrate incorporated in a polyethylacrylate rubber.

3,698,317

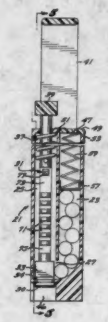
FLARE GUN

William L. Finch, 1644 21st Street, Manhattan Beach, Calif.

Filed April 19, 1971, Ser. No. 135,037

Int. Cl. C06d *1/04*; F41c *27/06*

U.S. Cl. 102—37.4 **10 Claims**



A hand operated flare gun including a housing formed with an elongated flare magazine having an ejector compartment co-extensive therewith. The magazine terminates in its lower end with an outlet leading to the ejector compartment and an ejector is disposed in such compartment and includes a plunger reciprocable from a retracted position behind the outlet to an ejecting position adjacent such outlet. The ejector is biased to its ejecting position and includes a trigger disposed adjacent a hand grasp handle on the housing. Igniting means is disposed adjacent one end of the outlet whereby an operator may grasp the handle and pull the trigger rearwardly to enable a flare to be discharged from the outlet and into the path of the plunger and the trigger may then be released to enable the plunger to be biased to its ejecting position to engage the flare and eject it outwardly past the igniting means to ignite one end thereof.

3,698,318

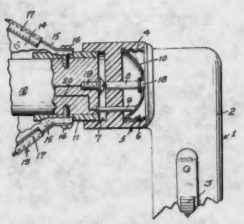
ADAPTABLE PYROTECHNIC CANDLE WITH DISPOSABLE FOLDING SHIELD

Glenn L. Shira, Newark, Del., and Joseph N. Ruff, Havre de Grace, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 21, 1970, Ser. No. 100,017

Int. Cl. C06d *1/10, 1/04*

U.S. Cl. 102—37.8 **9 Claims**



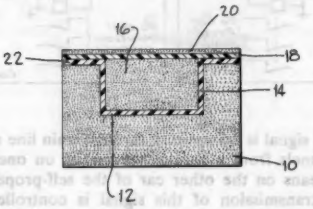
A high intensity pyrotechnic candle with disposable, foldable shield for producing a temporarily blinding light source as a mob dispersal means during periods of reduced light and consists of a conical shield of aluminum backed, asbestos

cloth, reinforced by a plurality of flat steel springs secured longitudinally to the cloth and attached at their rearward ends to a bushing which receives the candle. The bushing is inserted into an adaptor having embedded electrical contacts. The adaptor is screwed onto the lens cap threads of a standard hand flashlight. The candle is then ignited by turning on the flashlight's switch.

3,698,319
HIGH TEMPERATURE-RESISTANT WATERPROOF CASELESS PRIMER

Joseph B. Quinlan, and Earl F. Van Artsdalen, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army

Filed June 8, 1971, Ser. No. 151,087
Int. Cl. F42b *3/10*
U.S. Cl. 102—45 **4 Claims**

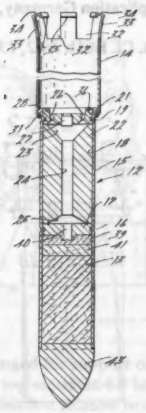


A combustible primer for use with caseless small arms ammunition, the primer being resistant to water, and elevated temperatures and less prone to accidental ignition and cook-off. The primer pellet is completely surrounded by energetic, high-temperature resistant, waterproofing seals, none of which require any liquid binder for room temperature pressure bonding thereof.

3,698,320
TELESCOPIC ROCKET

David L. Cochran, Danville; Arthur L. Deleray, Pleasanton, and John P. Lehman, Alamo, all of Calif., assignors to M B Associates, San Ramon, Calif.

Filed July 29, 1970, Ser. No. 59,253
Int. Cl. F42b *15/00*
U.S. Cl. 102—49.3 **2 Claims**

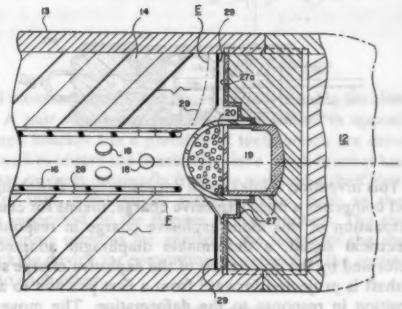


A safety device comprising a rocket having a body of cylindrical form and an ogive head over which a sleeve is slidably disposed in nested relation for storage. Upon initial movement of the rocket, the sleeve slides rearwardly so as to extend from the rear end thereof. If the rocket is directed outwardly into the relative airstream of an airplane, a javelin effect is produced so as to stabilize the rocket for travel in the direction of the airplane. If the rocket is directed upwardly from the ground by means of a hand-held launcher or other fixed launcher, the telescoping rear sleeve will cause the rocket to stabilize in flight.

3,698,321
ROCKET ASSISTED PROJECTILE

Richard H. Wall, Huntsville, Ala., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Oct. 29, 1969, Ser. No. 872,176
Int. Cl. F42b *13/02*
U.S. Cl. 102—49.3 **9 Claims**

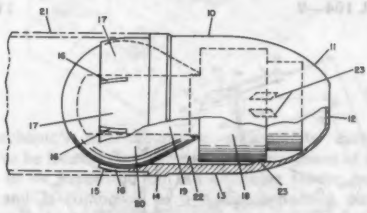


An improved projectile suitable for use in artillery pieces, through preferably in the higher calibres, is disclosed wherein projectile range upon launching by the gun is considerably extended by means of a solid propellant rocket motor in combination therewith which is characterized by internal means for supporting the solid propellant. Ignition of the propellant produces propulsive gases. The motor is operated after exit from the gun barrel and extends the flight range of the projectile.

3,698,322
PROJECTILE HOUSING

Donald Miller, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed April 21, 1971, Ser. No. 135,976
Int. Cl. F42b *13/12*
U.S. Cl. 102—56 **6 Claims**



A unitary, one piece projectile housing for a high explosive which explosive is within a container of a generally spherical shape and into which is threaded a fuze to form a fuze-ball assembly. The housing being generally cylindrical and having a closed nose end with the aft end provided with a converging spherically shaped portion. Said shaped portion being provided with a plurality of longitudinal slits thereby forming or defining a plurality of rearwardly extending spherical cantil-

ever springs. The housing being of a material which is relatively thin, elastic and resilient and having at its forward inner surface a plurality of annularly disposed, inwardly directed positioners.

3,698,323

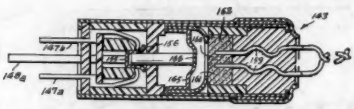
EXPLOSIVE OPERATED SWITCH FOR BOMB FUZING SYSTEM

Maurice Apstein, Bethesda, Md.; Evert Blomgren, Kensington, Conn.; George R. Keehn, Washington, D.C.; Laurence M. Andrews, Silver Spring, and Jacob Rabinow, Takoma Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Division of Ser. No. 555,216, Dec. 23, 1955. This application May 26, 1969, Ser. No. 848,129

Int. Cl. F42b *5/08*

U.S. Cl. 102—70.2 R 3 Claims



This invention relates to an explosive type switching device and comprises a main explosive charge, means for causing the detonation of this main explosive charge in response to an electrical signal, a deformable diaphragm adapted to be deformed by the detonation of the explosive charge such that a shaft is projected forward from a first position to a second position in response to the deformation. The movement of said shaft causes the actuation and change of mode of at least two sets of fixed contacts. Movement of the shaft transposes at least one electrical contact member such that the first set is electrically connected to each other when said shaft is in the first position. Upon movement of the shaft the first set of fixed contacts are irreversibly disconnected from each other and the shaft moves the electrical contact member to a second position irreversibly connecting the second set of fixed contacts to each other through the contact member. The second set of contacts are located at a plane transverse to the plane of the first set of contacts.

3,698,324

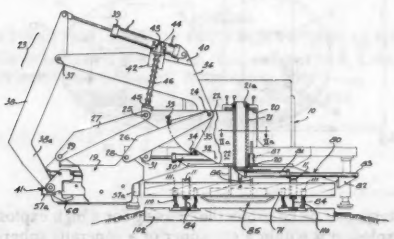
MACHINE FOR INSERTING TIES BENEATH A RAILROAD TRACK

Richard A. Peppin, and Lawrence D. Trottochau, both of Minneapolis, Minn., assignors to Mannix Construction, Inc., Minneapolis, Minn.

Filed Dec. 3, 1970, Ser. No. 94,749

Int. Cl. E01b *29/10*

U.S. Cl. 104—9 11 Claims



Ties dumped on the rails are withdrawn individually into a guide sleeve mounted on a tie inserting mechanism extending laterally from an on-track vehicle. The sleeve is then lowered to a location beneath the track and the withdrawn tie is pushed under the track and against an old tie to force the latter out. The track may be jacked up during this operation.

3,698,325

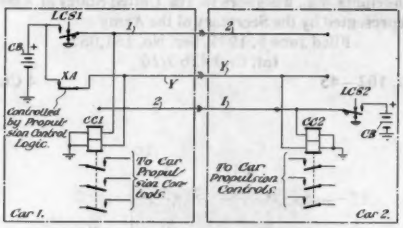
PROPULSION CONTROL SYSTEM FOR SELF-PROPELLED TWO-CAR TRAINS

Reed H. Grundy, Murraysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 26, 1970, Ser. No. 66,971

Int. Cl. B61c *3/00*

U.S. Cl. 105—61 9 Claims



A special signal is transmitted through train line communication channels from a transmitter means on one car to a receiver means on the other car of the self-propelled train unit. The transmission of this signal is controlled by the propulsion control logic means located on one car. The receiver means includes a relay which controls the propulsion condition of one of the cars, normally the trailing car, shifting between direct, multiple unit control from the operator's position and a preset condition, e.g., propulsion off, as the special signal is or is not received. The special signal may be direct current energy or alternating current energy having a selected frequency characteristic. This latter signal is superimposed on train line channels used for other purposes, e.g., the directional train line wires. The direct current signal, however, requires a separate, dedicated train line channel used in conjunction with the directional train line wires.

3,698,326

TRANSPORT UNIT FOR OVERHEAD OR SUSPENDED CONVEYOR SYSTEMS

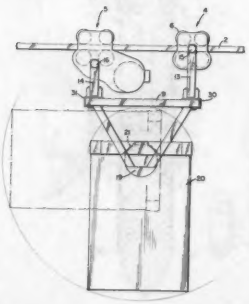
Eugen Schurch, and Rolf Storrer, both of Gerlafingen, Switzerland, assignors to Van Roll AG, Gerlafingen, Switzerland

Filed June 2, 1970, Ser. No. 42,778

Claims priority, application Germany, June 2, 1969, P 19 28 058.1

Int. Cl. B61b *3/02, 13/04*

U.S. Cl. 105—156 4 Claims



A transport unit constructed for the suspension of load-carrying containers or the like for single-track overhead conveyor

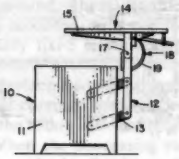
systems, incorporating two undercarriages which are operatively coupled together by a coupling mechanism of the invention. This coupling mechanism comprises swivel frame means embodying a support frame having two support arms, and wherein such coupling mechanism further includes at most two pairs of swivel joints arranged at pivot axes which are disposed substantially perpendicular to one another.

3,698,327

COUNTERBALANCING TABLETOP CONSTRUCTION

James R. Litvinoff, Phillips, and David F. Evans, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 4, 1971, Ser. No. 103,528
Int. Cl. A47f 5/12
U.S. Cl. 108—2 **14 Claims**



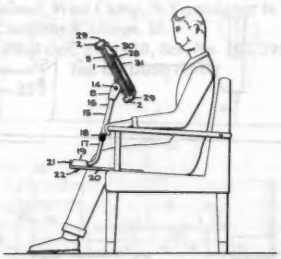
A counterbalancing mechanism for a table, such as a drafting table, having an angularly adjustable top. The mechanism is double acting, thereby counterbalancing the top against forward tipping forces when it is moved towards a horizontal position, and against rearward tipping forces when it is moved towards a vertical position, and is adjustable to control the onset and thereby the magnitude of such counterbalancing forces.

3,698,328

READING TABLES

Stanley M. Weir, 1717 Woodland Avenue, Palo Alto, Calif.

Filed Oct. 21, 1968, Ser. No. 769,347
Int. Cl. A47f 5/12
U.S. Cl. 108—6 **6 Claims**



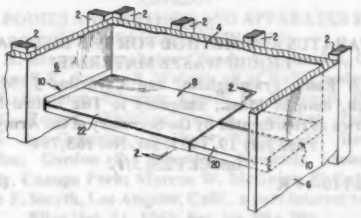
A reading table arranged for support on a bed, chair or the floor including a table top mounted for lateral shifting motion as well as changed inclination relative to upright legs and supporting feet, each of the latter being arranged for adjustment to vary the disposition of the table top and to enable collapse into a storage position wherein the top, legs and feet reside in adjacent parallel planes.

3,698,329

WALL MOUNTED SHELF ASSEMBLY

Robert F. Diamond, Reston, Va., and George W. Kingston, Chevy Chase, Md., assignors to Timber Engineering Company, Washington, D.C.

Filed Jan. 15, 1971, Ser. No. 106,809
Int. Cl. A47b 23/00
U.S. Cl. 108—42 **7 Claims**



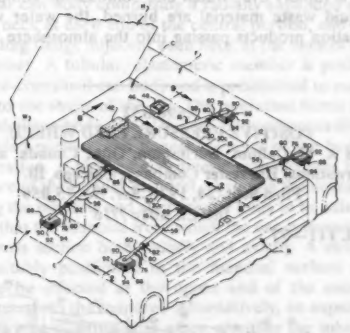
A wall mounted shelf assembly especially suitable for closet shelves. A pair of support brackets are installed in opposite walls. Each bracket has a plurality of teeth which are driven into the wall to secure the bracket in place. Each bracket has a flange that projects outwardly from the wall and a shelf that is formed of thin, substantially rigid, material, such as sheet metal, is supported on the flanges of the brackets. The shelf has telescoping sections for adjusting the length of the shelf and a locking device for preventing movement of the sections relative to each other.

3,698,330

MECHANIC'S OVER-THE-ENGINE ACCESSIBILITY CARRIER

Thomas C. Krombach, 17 Saint Joan Lane, Cheektowaga, N.Y.

Filed March 30, 1971, Ser. No. 129,405
Int. Cl. A47b 23/00
U.S. Cl. 108—44 **10 Claims**



A mechanic's over-the-engine accessibility carrier is adapted to be located over the engine compartment of a vehicle and to be supported on the adjoining fender portions thereof and is composed of a body supporting assembly adapted to be located over the engine and including an upper and elongated rigid platform provided with a head rest and a tool tray and a lower elongated supporting frame provided with longitudinal bearing shafts and lateral flanges, and four elongated telescopic leg assemblies adapted to extend laterally outwardly and downwardly from opposite sides of the body supporting assembly adjacent opposite ends thereof, with each leg assembly including a transverse sleeve at its inner end pivotally mounted on and adjustable longitudinally of the corresponding bearing shaft, a spring biased lever and detent

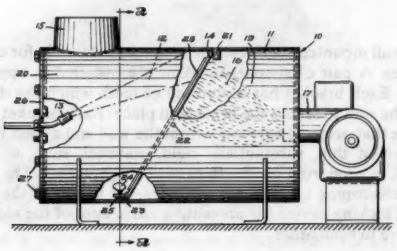
device intermediate its ends for longitudinal adjustment thereof, an adjustable depending foot pad at its outer end and adapted to rest upon the underlying fender portion and a longitudinally adjustable stop including a wedge engageable between the underside of the corresponding lateral flange and the upperside of the inner end of the corresponding leg assembly for varying and limiting its outward pivotal movement about and longitudinal adjustment along the corresponding bearing shaft.

3,698,331

APPARATUS AND METHOD FOR THE DISPOSAL OF LIQUID WASTE MATERIAL

Alton J. Rohr, Framingham, and Cornelius J. McKeown, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army

Filed July 19, 1971, Ser. No. 163,794
Int. Cl. F23g *5/12*
U.S. Cl. 110—7 R **10 Claims**



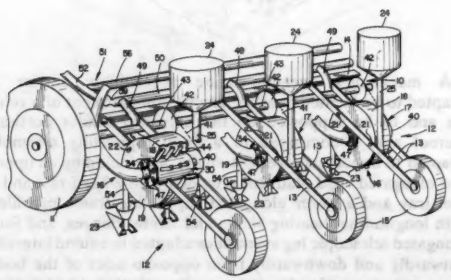
An incinerator and method for the disposal of liquid waste material containing a substantial amount of water. The incinerator comprises a hollow shell having an inclined elliptically shaped thermally conductive baffle plate having a plurality of openings therethrough. The baffle plate is mounted at an oblique angle inside of the shell, dividing the latter into two portions. Liquid waste material is sprayed through a nozzle onto the upper surface of the baffle plate while a fuel-fired flame is directed against the lower surface of the baffle plate. Water is rapidly evaporated and combustible components of the liquid waste material are burned, the water vapor and combustion products passing into the atmosphere through a flue.

3,698,332

POSITIVE PRESSURE FEED WHEEL

Donald A. McCallum, Burlington, Ont., Canada, assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 24, 1970, Ser. No. 75,059
Int. Cl. A01c *7/18*
U.S. Cl. 111—77 **11 Claims**



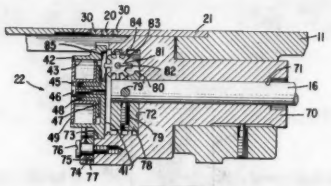
A positive pressure feed wheel for a planter of the pneumatic type wherein a hollow rotor vented to atmospheric air pressure is provided with radial fingers having a passage therethrough terminating in a seed pick-up port. The rotor is rotatable in a closed stationary housing having an internal air pressure greater than atmospheric, so that positive air pressure forces seed against the ports and holds them there during a predetermined rotation of the rotor.

3,698,333

ROTATING SHUTTLE DRIVE MECHANISMS

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.

Filed June 7, 1971, Ser. No. 150,608
Int. Cl. D05b *57/08*
U.S. Cl. 112—189 **4 Claims**



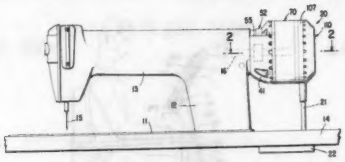
A drive mechanism for a rotary shuttle in which the shuttle is operatively connected to a rotary actuator by means of a pinion extending therebetween and serving as a radial driving key. In order to pass needle thread loops between the shuttle and the pinion, the pinion is turned slowly about its own axis during rotation of the shuttle so that the thread loops will be carried in one of the radial indentations between adjacent pinion teeth.

3,698,334

POSITION SIGNALING DEVICES FOR SEWING MACHINE DRIVING UNIT

Johann O. Kleinschmidt; Heinz E. Walter, both of Blankenloch-Buchig, and Helmar H. Holl, Karlsruhe, all of Germany, assignors to The Singer Company, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,664
Int. Cl. D05b *69/24*
U.S. Cl. 112—220 **5 Claims**



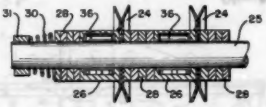
A direct drive unit for a sewing machine applied on the sewing machine frame co-axially of the sewing machine main shaft including a device for producing signals responsive to discrete positions of the sewing machine main shaft. The position signaling device is capable of indicating a plurality of different angular positions of the sewing machine main shaft, which positions may be selected simply by turning frictionally restrained arms accessibly located on the free extremity of the drive unit into the angular positions for which signals are desired.

3,698,335

WRAP-AROUND MECHANISM FOR THE STOP MOTION MEANS OF A MULTI-NEEDLE SEWING MACHINE

Harold C. Forrester, and Harold E. Tatum, both of Louisville, Ky., assignors to Louisville Bedding Company, Louisville, Ky.

Filed May 20, 1971, Ser. No. 145,325
Int. Cl. D05b *49/00*
U.S. Cl. 112—243 4 Claims



An automatic stop motion means using, at the beginning of the conventional thread-tensioning section, a separate rotary wrap-around unit for each separate needle thread, each unit comprising a wrap-around wheel mounted on a one-way clutch. All units are mounted on a common shaft which is driven at an adjustably fixed minimum speed. Each wrap-around wheel is normally rotated by its needle thread at a thread-dictated speed which is higher than the adjustably fixed minimum speed of that common shaft. Upon the breakage of a given needle thread, the rotary speed of its wrap-around wheel quickly decreases. When the decreasing rotary speed of the wrap-around wheel equals the fixed speed of said common shaft, which is set to approximate (but not to equal or exceed) the minimum speed of the slowest moving unbroken needle thread, the common shaft will then take over the job of rotating that particular wrap-around wheel. Consequently, the supply end of the broken needle thread continues to be fed into the thread-tensioning section while the withdrawal of that thread from that section decreases and may stop altogether. This action hastens its loss of tension in the thread-tensioning section and correspondingly hastens the operation of the threadtension sensor in shutting down the sewing machine.

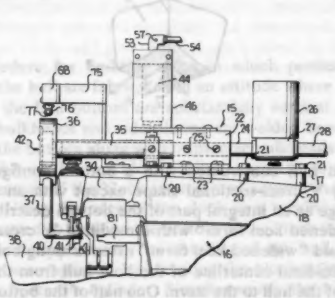
The foregoing arrangement not only minimizes the frequency of shut-downs, due to overloads on the fastest threads and to false indications of thread breakage on the slowest threads, but also minimizes the "line-out" time, which elapses between thread breakage and shut-down, and thus correspondingly reduces the length of the "line-out" (i.e. the line which is not stitched into the work by the broken thread) and the magnitude of the repair required to correct it.

3,698,336

DEVICE FOR TACKING DOWN THE FREE END OF A THREAD CHAIN

Wilbur A. Launer, West Camp, N.Y., assignor to Union Special Machine Company, Chicago, Ill.

Filed Dec. 29, 1970, Ser. No. 102,295
Int. Cl. D05b *65/04*
U.S. Cl. 112—252 18 Claims



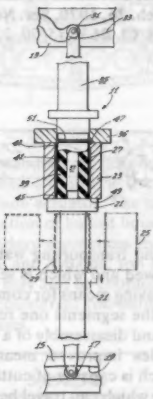
This disclosure relates to an attachment for a sewing machine for automatically picking up the loose end of a thread chain and folding the same back under the presser foot against the direction of feed, in which position the thread chain is automatically sewn down during the formation of stitching in the next workpiece. The attachment is automatic in operation with the operation thereof timed so as to make certain that the thread chain is folded back in position when the next work is presented to the sewing machine so that the thread chain is tacked down from the first stitch implanted in the next work.

3,698,337

CAN BODIES AND METHOD AND APPARATUS FOR MANUFACTURE THEREOF

William H. Brawner, Anaheim; Claude A. Gunsalus, Covina, and Lowell K. Rockwell, Walnut, all of Calif., assignors to Dale E. Summer, Tiburon; Lowell K. Rockwell, Walnut; Paul C. Rogers, Whittier; Nick A. Laznibat, Fullerton; Claude A. Gunsalus, Covina; William H. Brawner, Anaheim; Gordon R. Kimmich, Newhall; Leonard J. Plourde, Canoga Park; Marcus W. McGuire, El Cajon and George F. Smyth, Los Angeles, Calif., a part interest to each

Filed Dec. 11, 1969, Ser. No. 884,299
Int. Cl. B21d *51/00, 22/10*
U.S. Cl. 113—120 AA 23 Claims



A tubular can body comprising a radially expanded central portion, a neck at each end of the central portion, and a radially extending flange adjacent each neck at the ends of the tubular member. A tubular, elastomeric member is positioned within a die-contained can body and is pressurized to mold the can body to the shape of the die. The operation forms a radially expanded can body, necks the can body adjacent the radially expanded portion, and flanges the ends of the body in a single operation. A tapered elastomeric mandrel may be utilized in place of the tubular mandrel, obviating the necessity of lubricating the mandrel and allowing the body to be axially extended so that the material from which the can is formed is altered in cross section both radially and axially. A structural groove, suitably positioned in the mandrel surface allows flanging to be effected at the upper end of the can body without damage to the mandrel. Alternatively, an expandable member may be substituted in place of either the tubular or tapered mandrel to form the can body through use of hydraulic pressure.

3,698,338

SUBMARINE SNORKEL CAMOUFLAGE METHOD

Emil W. Hymowitz, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 16, 1958, Ser. No. 780,904
Int. Cl. B63g *9/00, 9/02, 13/00*
U.S. Cl. 114—15 3 Claims

1. In combination with a submarine having a hull, a snorkel housing extending vertically from said hull, a water nozzle

having a horizontal flow axis fixedly secured to said snorkel, means connected to said nozzle for admitting water thereto, and adjusting means for controlling the amount of water and

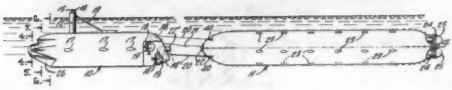
shape of water spray released from said nozzle, whereby the amount of radar echo from said exposed submarine is effectively diminished and detection of said submarine is obviated.

3,698,339

METHOD AND MEANS FOR THE WATER TRANSPORT OF LIQUIDS

Marcel J. E. Golay, 116 Ridge Road, Rumson, N.J., and Amory H. Waite, Jr., 46 Monmouth Boulevard, Oceanport, N.J.

Filed Feb. 26, 1970, Ser. No. 14,482
Int. Cl. B63b *35/00, 25/08*
U.S. Cl. 114—16 R **9 Claims**



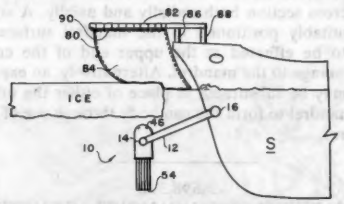
A submersible fluid transporting watercraft which may be self-propelled or towed and which is separable into segments with the segments having means for compensation for bouyancy and for shifting the segments one relative to the others to facilitate assembly and disassembly of a single unit. The invention further includes improved means for navigating ice covered waters which is capable of cutting through ice of substantial thickness or which can travel beneath the ice in waters of adequate depth.

3,698,340

ICE-BREAKING SYSTEM FOR SHIPS

Jacob C. Wagner, P.O. Box 133 New Castle, New Castle, Del.

Continuation-in-part of Ser. No. 16,516, March 4, 1970. This application March 2, 1971, Ser. No. 120,271
Int. Cl. B63b *35/08*
U.S. Cl. 114—40 **12 Claims**



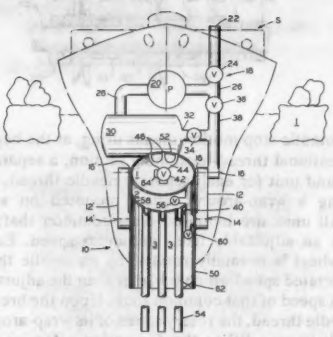
A system for making navigable channels through heavy sea-ice, comprising a ship carried, compressed-air operated, water-thrust actuated vertical ram for positioning beneath the water to break sea-ice by powered upward impacts with the under surface of the ice, accompanied by water-hammer ice shattering action, interspersed with powered descents, in rapid oscillation; a co-acting spray suppressant curtain and a spray suppresant underwater thrust exhaust are disclosed, as well as an inertia-slug valve design in one embodiment to further the ice breaking efficiency.

3,698,341

ICE-BREAKING HAMMER ATTACHMENT FOR SHIPS

Jacob C. Wagner, P.O. Box 133 New Castle, New Castle, Del.

Filed March 4, 1970, Ser. No. 16,516
Int. Cl. B63b *35/08*
U.S. Cl. 114—40 **13 Claims**



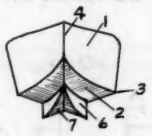
A sea-ice breaker for ships, including a ship-borne high capacity source of compressed air and a submersible free-floating vertical ram assembly for pivotal attachment to the bow of a ship, the ram consisting of three chambers: an uppermost spheroidal chamber reinforced for splitting the ice from beneath by impact and having connection to the high-pressure air supply for throwing the ice aside after splitting by exhausting fluid against it under high pressure; a middle chamber connected through a header with a downwardly disposed array of parallel pipes and having connection to the high pressure air supply for driving the ram upward against the ice by rapid downward expulsion of seawater from the pipes; and a bell-like lower chamber open at the bottom to serve as an air-spring, and having connection to the high pressure air supply for adjusting the nominal buoyancy of the ram assembly and for supplying extra driving force to the ram when required.

3,698,342

BOAT HULLS

Donald N. Jackson, 9402 44th Avenue S.W., Seattle, Wash.

Field Dec. 30, 1970, Ser. No. 102,820
Int. Cl. B65b *1/18*
U.S. Cl. 114—66.5 R **3 Claims**



A boat hull constructed with a bottom configuration of generally V cross-sectional shape except with an additional appendage as an integral part of the bottom described herein as a "widened keel form" with a modified W cross-sectional shape. Said "widened keel form" extends along both sides of the longitudinal centerline of the boat hull from the forward section of the hull to the stern. One half of the bottom portion of the said "widened keel form" is located approximately in the same inclined plane or nearly parallel plane to that of the opposite V bottom side of the boat hull. The forward portion

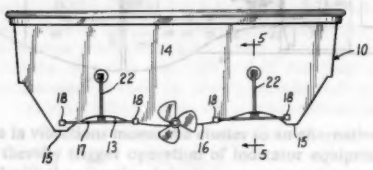
of said "widened keel form" extends above the load water line of the boat hull.

3,698,343

BOAT HULL

Martin W. Boome, 12 Hampstead Court, Nova Scotia, Canada

Filed Jan. 7, 1971, Ser. No. 104,585
Claims priority, application Canada, Feb. 3, 1970, 073,870
Int. Cl. B63b *1/28*
U.S. Cl. 114—66.5 P 8 Claims



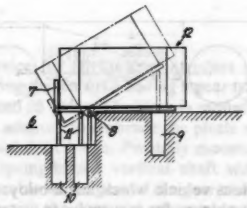
The hull bottom is shaped to form a longitudinal air-water channel which in the stern portion of the hull is divided into two transversely spaced air-water passages open at the transom. A pair of trim tabs are horizontally pivoted on the transom in such position that streams of air-water from the passages flow over as well as under the trim tabs.

3,698,344

SHIP BUILDING METHOD

Kazuo Maeda, Chiba, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Jan. 12, 1971, Ser. No. 105,870
Claims priority, application Japan, Sept. 4, 1970, 45/77564
Int. Cl. B63b *3/02*
U.S. Cl. 114—77 R 4 Claims



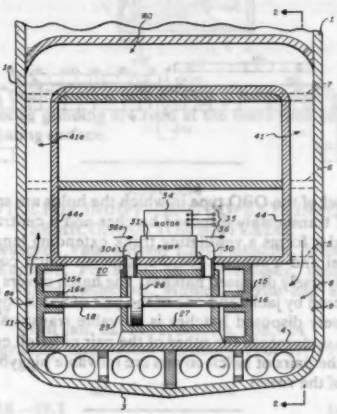
A procedure for building ships in which predetermined blocks of the hull are fabricated in an attitude where both the deck and the hull bottom are substantially vertical and longitudinal bulkheads and side plating are welded between the deck and the bottom along with transverse bulkheads. Following assembly of the hull block, it is transported to dockside and the bottom of the block is projected beyond the edge of the dock. Using the edge of the dock as a turning axis, the block is rotated to position the bottom of the block lowermost and the deck uppermost. The rotation of the hull block is preferably accomplished by elevating the block adjacent the deck by a hydraulic cylinder. Simultaneously the bottom of the hull block is lowered by hydraulic cylinders. A swing table may be used to support the hull block during such rotation, the table being pivoted to the edge of the dock.

3,698,345

ACTIVE TANK STABILIZER FOR MARINE VESSELS

Frederick J. Kreitner, Syosset, N.Y., assignor to Sperry Rand Corporation

Filed Dec. 28, 1970, Ser. No. 101,648
Int. Cl. B63b *43/06*
U.S. Cl. 114—125 8 Claims



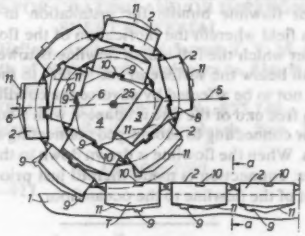
Active tank ship's stabilizer devices are disclosed having symmetrically positioned variable active tanks operated in cooperation by a common actuator. The tanks are arranged to permit injection or ejection of ballast liquid in a system avoiding unstabilizing secondary resonances by additively combining the effects of static and dynamic roll moments of the ballast liquid. The system may also be coupled to the ship's hull in such a manner as to counteract roll-induced disturbances of the ship about its yaw axis.

3,698,346

ROLL-BACK CLOSURE ASSEMBLY FOR LARGE OPENINGS, ESPECIALLY FOR HATCH OPENINGS OF SHIPS

Ralf Bauer, Warnemunde, Germany, assignor to Veb Warnowwerft, Warnemunde, Germany

Filed April 9, 1970, Ser. No. 27,016
Int. Cl. B63b *19/20*
U.S. Cl. 114—201 9 Claims



A roll-back closure assembly for large openings, especially for the hatch openings of marine vessels, comprises a plurality of deck elements of identical dimensions which are articulated to one another. When the assembly is rolled back, the pivotal axes of the linkage members between the elements lie along an Archimedian Spiral.

3,698,347

HATCH COVERS AND VENTILATING SYSTEM

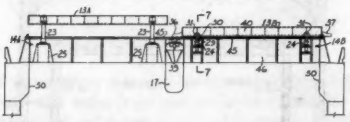
Norman V. Laskey, 3641 Aylmer Street, Montreal, Quebec, Canada

Filed Jan. 5, 1971, Ser. No. 104,092

Claims priority, application Great Britain, May 19, 1970, 24,091/70

Int. Cl. B63b *19/18*

U.S. Cl. 114—202 12 Claims



A vessel of the OBO type in which the holds are serviced by a pair of transversely disposed hatches and a central longitudinal girder forms a ventilating trunk extending lengthwise of the vessel and a support for the adjacent hatch coamings of the transversely disposed hatches. The hatch covers are raised and lowered by jacks and one of the pair of hatch covers of the transversely disposed hatches is movable transversely of the vessel to underneath the other of the pair of hatch covers, and both of the pairs of hatch covers are movable piggyback transversely of the vessel.

3,698,348

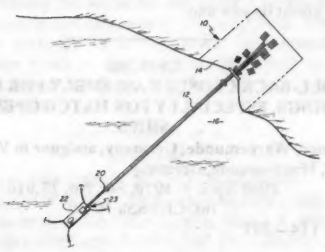
METHOD AND APPARATUS FOR SUBSURFACE TOWING OF FLOWLINES

George W. Morgan, Anaheim, Calif., assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Sept. 21, 1970, Ser. No. 74,052

Int. Cl. B63b *21/00*

U.S. Cl. 114—235 B 14 Claims



This disclosure is directed to a method of transporting a flowline or flowline bundle for installation in an offshore petroleum field wherein the fabrication of the flowline is land based, after which the full-length flowline is towed (at a sufficient depth below the surface of the water) to the installation site, so as not to be affected by adverse sea conditions while in tow. Each free end of the line is adapted with a connecting apparatus for connecting to submerged connecting assemblies or structures. When the flowline is drawn down to the connecting assemblies, connection is made thereto just prior to the final settlement of the flowline to the ocean floor.

3,698,349

SEAGOING TUG AND BARGE CONSTRUCTION

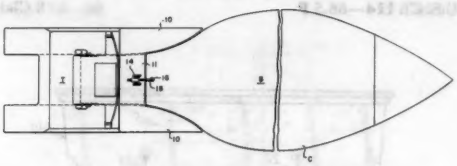
John N. Stevens, West Palm Beach, Fla., assignor to Catug Corporation, Fort Lauderdale, Fla.

Filed June 29, 1971, Ser. No. 157,875

Int. Cl. B63b *21/00*

U.S. Cl. 114—235 R 10 Claims

An integrated tug and barge unit capable of operation on the high seas is produced by providing a twin hull tug boat of the catamaran type and having a horizontally disposed shelf connecting the twin hulls to one another and adapted to receive and retain a projection extending rearwardly from the aft end of the sea-going, cargo carrying barge in firm engagement therewith. The tug boat has a portion of the forward end of each hull shaped to conform with the curvature of a portion of the aft end of the barge hull so that a substantially tight mating engagement therebetween can be provided. Positively driven sliding wedge units or like wedging means are positioned between the barge and tug engagements to insure a tight engagement and to eliminate any relative movement between the tug and barge. Further, positively driven connecting and disconnecting means are provided between the forward end of the barge and the aft end of the tug to draw the tug and barge tightly together and thus prevent the tug from moving aft relative to the barge.



3,698,350

AMPHIBIOUS VEHICLE

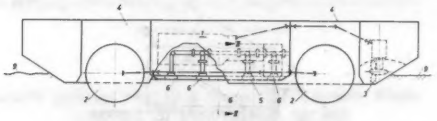
Hermann Walter Gehlen, Pirmasenser Strasse 60, Kaiserslautern, Germany

Filed Nov. 10, 1969, Ser. No. 875,099

Claims priority, application Germany, May 23, 1969, P 19 26 388.8

Int. Cl. B63f *3/00*

U.S. Cl. 115—1 R 1 Claim



The amphibious vehicle which has a buoyant vehicle body and marine drive means for movement in water and wheels for driving on land, is provided at its bottom by substantially equally distributed air discharge nozzles supplied from a source of air under pressure to form a film of air between the bottom of the vehicle and any ground of muddy or sludgy consistency.

3,698,351

VIBRATION DETECTOR

Robert S. Harrah, P.O. Box 14410, Houston, Tex., and Manmohan Suigh Kalsi, 8706 Amblewood Drive, Houston, Tex., assignors to said Harrah, by said Kalsi

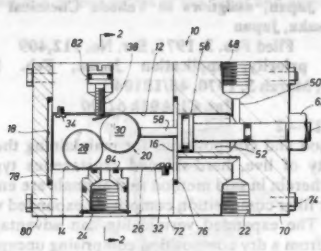
Filed Oct. 27, 1969, Ser. No. 869,718

Int. Cl. G01l *19/12*

U.S. Cl. 116—70 10 Claims

For use in detecting vibrations of rotary equipment or the like, the apparatus incorporating a case enclosing a rolamite structure including a pair of cylindrical rollers and tension

band, the band being biased to position the rollers at a range of locations on normal or non-excessive vibrations wherein an



increase in vibrations moves the cluster to an alternative position to thereby trigger operation of indicator equipment associated with the vibration detector.

3,698,352

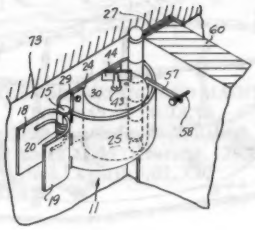
BURGLAR ALARM

Willey G. Forman, 153 S. Palm Drive, Beverly Hills, Calif.

Filed July 16, 1971, Ser. No. 163,326

Int. Cl. G08b *13/08*

U.S. Cl. 116—86 **9 Claims**



An alarm device for frightening intruders consisting of a key-wound, spring-driven siren having a gear train between its driving spring and its rotor. The siren is mounted on one leaf of a spring clip adapted to embrace the pintle sleeve portions of a conventional door hinge. Pivotally mounted in the siren assembly is a spring-biased vertical shaft with a first arm lockingly engageable with a gear of the gear train and a second arm engageable with the door and arranged to rotate the shaft so as to release the gear when the door is opened and thereby to cause the siren to be activated.

3,698,353

INDICATOR PROVIDED WITH A PLURALITY OF CONCENTRIC INDICATING NEEDLES

Masatake Nakahata, and Tatsuo Sugi, both of Mitaka, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

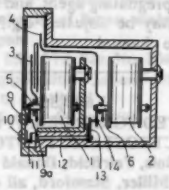
Filed Feb. 24, 1971, Ser. No. 118,253

Claims priority, application Japan, Feb. 27, 1970, 45/18699

Int. Cl. G09f *9/00*

U.S. Cl. 116—129 A **6 Claims**

An indicator is provided with a plurality of indicating needles on the same indicating surface. The revolving axis of the indicating needles are arranged on one straight line. One of the indicating needles is provided for indicating a low sensitivity range (L range), another of the indicating needles is provided for indicating a high sensitivity range (H range). By using the above-mentioned indicator in automatic measuring



apparatus, the indication of full range grinding and the condition of precise grinding are read at the same time and on the same indicating surface.

3,698,354

DEVICE FOR INDIFFUSING DOPANTS INTO A SEMICONDUCTOR MATERIAL

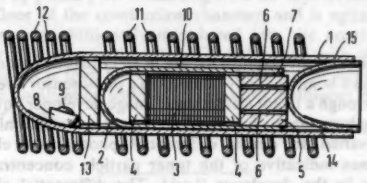
Konrad Reuschel, Vaterstetten; Karl Platzoder, Munich, and Helga Kursawe, Pretzfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Berlin and Erlangen, Germany

Filed Jan. 22, 1971, Ser. No. 108,724

Claims priority, application Germany, Feb. 27, 1970, P 20 09 359.8

Int. Cl. C23c *13/08*

U.S. Cl. 118—49.1 **14 Claims**



The present invention relates to a device for indiffusing dopants into a semiconductor material, in high vacuum. The device comprises a heatable ampule which is accommodated in a sealed container and consists of the same semiconductor material and contains wafers of the semiconductor material to be doped. The ampule, at least on its outer surface, has at least a partially polycrystalline surface. The ampule has openings whose area is small in comparison to the cross-section surface of the ampule and that a dopant source is available which is located outside the ampule but within the sealed container.

3,698,355

APPARATUS FOR COATING AND/OR IMPREGNATING A SHEET MATERIAL

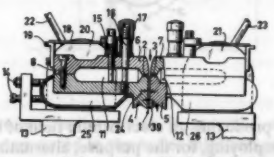
James W. I. Heijnis, Arnhem, and Joseph T. V. M. Geusgens, Dieren, both of Netherlands, assignors to Aku N. V., Arnhem, Netherlands

Filed Nov. 17, 1969, Ser. No. 877,140

Claims priority, application Netherlands, Nov. 29, 1968, 6817090

Int. Cl. B05c *3/00*

U.S. Cl. 118—411 **2 Claims**



A sheet being passed through a slit-shaped channel in a metering device is contacted on one or more sides with a coating

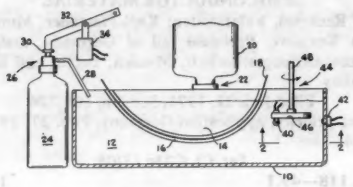
and/or impregnating agent which is supplied through one or more feed openings in the walls of the channel. The size of the feed openings may be adjusted to vary the distribution of the coating and/or impregnating agent, and the contour of the slit-shaped channel may be adjusted e.g., to vary the pressure build-up within the channel.

3,698,356

COMPENSATED TONER DENSITY CONTROL FOR ELECTROSTATIC PHOTOCOPIES

Robert Clark DuBois, Fairfield; Donald G. Mikan, Ridgefield, and Wayne H. Miller, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 21, 1971, Ser. No. 108,329
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **18 Claims**



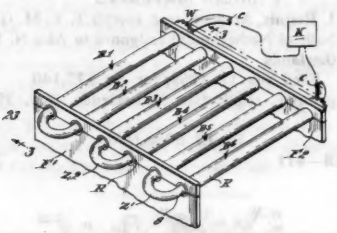
A toner density control for use in electrostatic photocopiers employs a lamp optically coupled to a photosensor over a light path through a latent electrostatic image developer liquid. The spacing between the lamp and photosensor is uniformly, cyclically varied to derive differential photosensor electrical responses indicative of the toner particle concentration or density in the developer liquid. The differential electrical responses are processed and utilized to selectively control replenishment of the toner particle concentration in the developer liquid.

3,698,357

GRID FOR PRODUCING AN ELECTROSTATIC FIELD

Francis T. Spencer, Biddeford, Maine, assignor to West Point-Pepperell, Inc., Boston, Mass.

Filed Dec. 5, 1969, Ser. No. 882,466
Int. Cl. B05b *5/02*; H01b *5/00*
U.S. Cl. 118—636 **9 Claims**



A grid for producing an electrostatic field of high intensity, capable of employing, for the purpose, alternating current in a range from 40,000 volts to 100,000 volts or more without arcing or rapid deterioration of the grid.

3,698,358

METHOD FOR MAINTAINING FRESHNESS OF AQUATIC ANIMALS

Takeo Wada; Kazuo Okada, and Masaru Ohyama, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 3, 1971, Ser. No. 112,409
Claims priority, application Japan, Feb. 13, 1970, 45/12703; March 3, 1970, 45/18104
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **10 Claims**

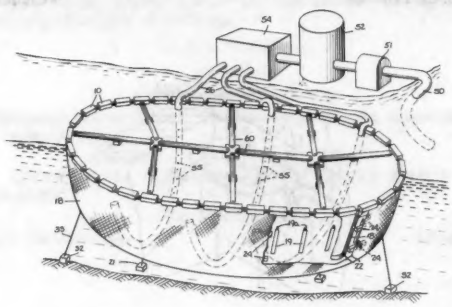
A method and compositions for maintaining the freshness or viability of live, hard-skinned crustaceous type aquatic animals wherein in said method said animals are embedded in a granular filler composition comprising expanded vermiculite particles. The expanded vermiculite can advantageously be prepared from a dry composition comprising unexpanded vermiculite particles and a hydrogen peroxide addition compound by the addition of water thereto but expanded vermiculite made in other ways is also useful for the purpose.

3,698,359

FLOATING FISH ENCLOSURE

Howard J. Fremont, New York, N.Y., assignor to Marine Protein Corporation, New York, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,831
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **18 Claims**



A floating enclosure for containing a closed volume of water for efficient fish raising. A closed membrane, forming the sides and bottom of the enclosure, is supported by a closed anchored chain of floats. Protective nets can be provided, inside and outside the enclosure, to enhance durability. Stiffener slats, insertable in pockets in the sides of the membrane, are provided. Catwalks across the enclosure may be included. The water quality within the enclosure is controlled by pumping in oxygenated and treated water. Gutters are provided at the periphery of the enclosure whereby displaced water exits therefrom. Nonreflective sectional tarps are provided to furnish surface protection to the enclosed body of water, and to utilize absorbed sunlight in heating the water.

3,698,360

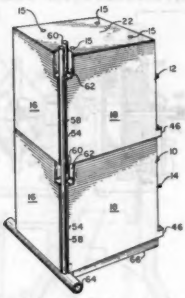
SMALL ANIMAL CAGE

Jeanette L. Rubricius, P.O. Box 66, New York, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,401
Int. Cl. A01k *01/02*
U.S. Cl. 119—17 **16 Claims**

A small animal cage is formed as a single unit from plastic compositions of a nature enabling it to accommodate scratching and biting actions by a housed animal without deleterious effect and in a structural symmetrical fashion so that several cages can be stacked in an interlocked and interchangeable assembly. Each cage is formed with five solid

walls and an open front which is closed off by hinged grill doors and each cage can be individually flushed and drained. The floor of each cage is pitched toward one rear corner wherein an opening communicates with a vertical drain pipe that is nested in a corner recess of the cages and empties into a



drain conduit that extends along the rear of a structural foam block having a rearwardly slanting top wall supporting the floor of the lowermost cage with the top walls of the cages being sloped rearwardly causing the floors of the upper cages to slope the same as the bottom cage.

3,698,361

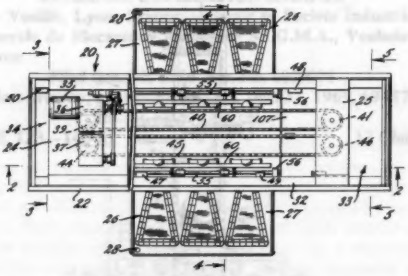
APPARATUS FOR FEEDING AND MAINTAINING NEONATAL PIGLETS

James G. Lecce, 2729 Cambridge Road, Raleigh, N.C.

Filed March 22, 1971, Ser. No. 126,751

Int. Cl. A01k *5/02, 7/02*

U.S. Cl. 119—51.11 **10 Claims**



Apparatus for feeding and maintaining newborn animals to increase the rate of survival as well as to increase the growth potential of the animals. The apparatus includes a plurality of individual cages or containers with one cage being provided for each animal, means for feeding each animal at specific time intervals with precise amounts of food based on the characteristics of the individual animals, and means for automatically cleaning the food receptacles at the termination of the feeding period to maintain the receptacles in an aseptic condition.

3,698,362

METHOD AND APPARATUS FOR INCINERATING WASTE OIL

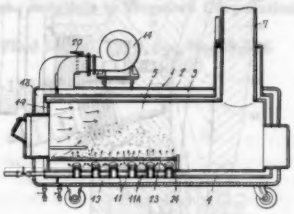
Wataru Ishibashi; Satoru Nakano, both of Shigaken, and Takeo Yokotani, Osaka, all of Japan, assignors to Iwatani & Co., Ltd., Osaka, Japan

Filed Jan. 15, 1971, Ser. No. 106,742

Claims priority, application Japan, March 23, 1970, 45/24654; June 4, 1970, 45/48957

Int. Cl. F22b *7/00*

U.S. Cl. 122—136 R **6 Claims**



Waste oil to be incinerated is atomized in a combustion chamber by primary air emanating from air tuyeres arranged on the floor of the combustion chamber, and is agitated by secondary air additionally introduced into the combustion chamber. The atomized waste oil is well mixed with air, and the waste oil is then ignited so that it can be incinerated in complete combustion without applying any additional burning device or agent.

3,698,363

ONCE-THROUGH BOILERS

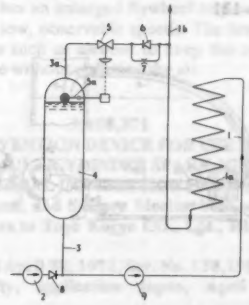
John Mackinlay Yellowlees, Knutsford, England, assignor to The Nuclear Power Group, Limited, Knutsford, England

Filed Dec. 22, 1970, Ser. No. 100,723

Claims priority, application Great Britain, Dec. 24, 1969, 62,781/69

Int. Cl. F22b *29/02*

U.S. Cl. 122—406 S **4 Claims**



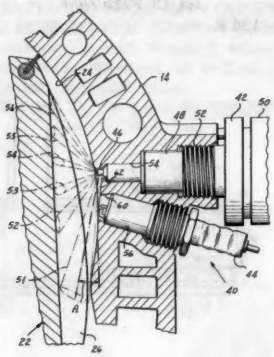
A 'once-through' boiler which is provided with a water storage drum connected to the boiler inlet and carries a head of water sufficient to maintain a supply of water to the tubes in the event of failure of external water supply to the boiler.

3,698,364

FUEL COMBUSTION SYSTEM FOR ROTARY PISTON INTERNAL COMBUSTION ENGINES

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation

Filed Feb. 26, 1971, Ser. No. 119,131
Int. Cl. F02b 53/10
U.S. Cl. 123—8.09 10 Claims



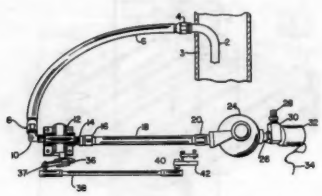
The fuel combustion system for a rotary piston, internal combustion engine having an unthrottled air intake port provides two sets of fuel burning means, each set comprising a fuel injector nozzle and spark plug combination supported in the engine housing in spaced relationship with the other set along a line parallel to the axis of rotor rotation. Each fuel injection nozzle is constructed and arranged to emit a plurality of fuel streams in different planes and directions into the working chambers of the engine. The fuel injection nozzles are each disposed relative to each other and with respect to the rotor direction of rotation to emit at least one of the streams of fuel in the same general direction as the direction of rotor rotation and the other fuel streams toward the adjacent set of injector nozzle and spark plug. This pattern of fuel emission provides the requisite distribution of fuel in the working chambers for achieving a proper stoichiometric mixture of fuel and air for improved combustion efficiency.

3,698,365

DIESEL BOOSTER

John E. Hallberg, Oakland, Calif., assignor to Industrial Propane, Inc.

Filed Sept. 14, 1970, Ser. No. 71,797
Int. Cl. F02b 49/00
U.S. Cl. 123—121 1 Claim



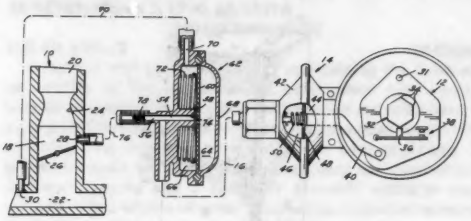
A source of constant pressure propane gas is inserted in the air intake manifold of a Diesel engine at a volume rate proportional to the Diesel fuel consumption. A specially designed metering valve coupled to the Diesel engine fuel pump facilitates regulation of the propane gas.

3,698,366

ENGINE SPARK TIMING CONTROL SYSTEM

Karl H. Gropp, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 3, 1970, Ser. No. 60,489
Int. Cl. F02p 5/06
U.S. Cl. 123—117 A 6 Claims



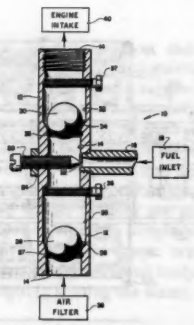
A mechanical device is located between the carburetor spark and intake manifold vacuum ports and the distributor breaker plate servo, the device containing two parallel flow circuits connected to the servo, one being connected to the spark port and containing an orifice, the other being connected to the intake manifold port and containing a servo operated valve that alternately blocks or unblocks the manifold vacuum application to the servo; the orifice providing slow changes in spark advance settings during light vehicle accelerations, and a rapid recovery upon subsequent momentary decelerations; the valve unseating during heavy accelerations to quickly lower the spark advance setting to avoid engine detonation.

3,698,367

GAS CARBURETOR VALVE

Orval L. Goodwin, Great Bend, Kans., assignor to Allan Pump and Supply, Inc., Great Bend, Kans.

Filed June 21, 1971, Ser. No. 154,866
Int. Cl. F02m 21/02; C10j 1/00
U.S. Cl. 123—120 9 Claims



A gaseous fuel carburetion device utilized with a reciprocating piston engine fueled with low pressure gas; the valve having a first check valve connecting to atmosphere allowing outside air to be sucked in but preventing the low pressure gas from flowing into the atmosphere, and a second check valve connecting with the intake of the engine allowing air and gas to flow into the engine only on the suction stroke, and a needle valve controlling the maximum rate of gas flow from the source.

3,698,368

FUEL FEED DEVICE FOR AN INTERNAL COMBUSTION ENGINE

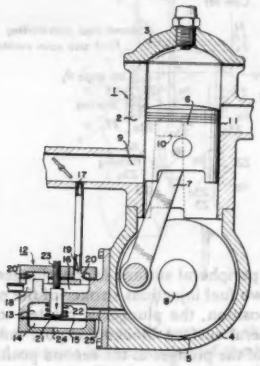
Hiroshi Yamamoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-ken, Japan

Filed March 8, 1971, Ser. No. 121,777

Claims priority, application Japan, March 13, 1970, 45/21310

Int. Cl. F02m *39/00*; F02b *33/04, 33/12*

U.S. Cl. 123—139 AJ 16 Claims



A fuel feed device for use in crank chamber compression-type two-cycle engines, comprising a first chamber and a second chamber separated by a movable member, means for communicating said first chamber with the crank chamber of said engine, a pump member operatively connected with said movable member, a pump chamber the volume of which varies incident to movement of said pump member, and valve means operative such that fuel is sucked into said pump chamber incident to movement of said pump member when said movable member moves from said first chamber toward said second chamber and is discharged therefrom incident to reverse movement of said pump member.

3,698,369

REGULATING DEVICES FOR THE FLOW OF FUEL IN INTERNAL COMBUSTION ENGINES

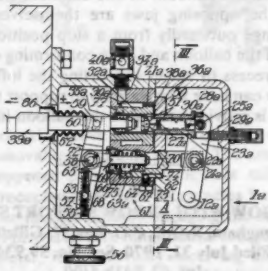
Andre Vuaille, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., Venissieux, France

Filed Dec. 30, 1970, Ser. No. 102,604

Claims priority, application France, Dec. 31, 1969, 6945752

Int. Cl. F02d *1/04, 31/00*

U.S. Cl. 123—140 R 13 Claims



The device comprises a centrifugal regulator, a first element mechanically actuated by the regulator, a second element actuating a regulating member for the flow per revolution of the pump, and linking means between the two elements including a hydraulic servo device. The latter is of the follower type and comprises a pilot slide valve constituting the first element and a jack provided with a differential piston constituting the second element. The slide valves and differential piston define a variable by-pass. The regulating member is constituted by first and second levers pivoted on axles which are connected to one another by a hydraulic time-delay. The device is especially useful for controlling the flow of large injection pumps.

3,698,370

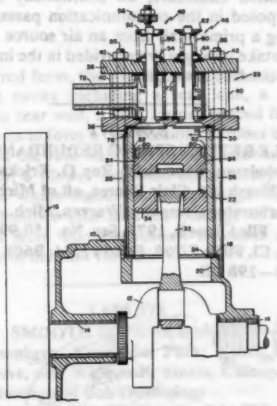
TRANSPARENT INTERNAL COMBUSTION ENGINE

Charles W. Haldeman, and Vahan V. Basmajian, both of Lexington, Mass., assignors to Megatech Corporation, Belmont, Mass.

Filed Sept. 3, 1970, Ser. No. 69,246

Int. Cl. F02f *1/00*

U.S. Cl. 123—193 CP 15 Claims



An operative internal combustion engine is transparent for demonstration of internal combustion engine principles. A transparent cylinder houses a noncontacting piston, the combustion chamber being sealed by means such as protruding annular teflon rings seated in an annular groove of the piston or a flexible flap formed integrally with the piston which is pressed firmly to the internal surface of the cylinder wall by pressure developed within the combustion chamber during operation of the engine. Other portions of the engine are transparent to enable their contained parts to be observed during operation. The engine also has an enlarged flywheel to permit operation of the engine at low, observable speeds. The invention burns low carbon fuels such as alcohol to keep the cylinder walls clean and operate without polluting the air.

3,698,371

SURGING PREVENTION DEVICE FOR USE IN VEHICLE HAVING MULTICYLINDER SPARK-IGNITION INTERNAL COMBUSTION ENGINE

Masaru Mitsuyama, and Shigeru Morita, both of Hiroshima, Japan, assignors to Toyo Kogyo CO., Ltd., Hiroshima-ken, Japan

Filed April 28, 1971, Ser. No. 138,195

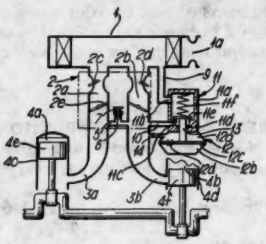
Claims priority, application Japan, April 28, 1970, 45/41660

Int. Cl. F02d *9/00*; F02m *13/04, 73/04*

U.S. Cl. 123—198 F 4 Claims

A device for preventing fluctuations in the output torque of a spark-ignition internal combustion engine which result from irregular combustion of air-fuel mixture. According to the

present invention, instead of the conventional idling device of which the idling jet is situated on the engine side of the edge of the throttle valve, a communication passage communicating at the downstream side of the throttle valves between a pair of intake passages each connecting the carburetor to the respec-



tive combustion chambers, an additionally fuel supplying means interposed in the communication passage and means for supplying a primary air from an air source to one of said pair of the intake passages are provided in the intake system of the internal combustion engine.

3,698,372

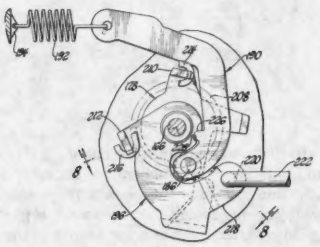
THROTTLE RETURN SPRING REDUNDANCY SYSTEM

Philip V. Eshelman, Southfield; Roy O. Erickson, Utica, and Keith D. Marsh, St. Clair Shores, all of Mich., assignors to Holley Carburetor Company, Warren, Mich.

Filed June 8, 1971, Ser. No. 150,997

Int. Cl. F02b *77/08;* **F02d** *11/04;* **B60k** *22/08*

U.S. Cl. 123—198 DB **15 Claims**



A throttle valve, situated within the induction passage bore of a fuel or air induction device, is carried by a throttle shaft for fixed rotation therewith; a lever fixedly connected to the throttle shaft is operatively connected to a remotely situated operator's foot-operated throttle control; a first throttle return spring is operatively connected to the first lever for returning the throttle valve to an idle position whenever the foot-operated throttle control is released; and a second safety spring is provided for assuring the movement of the throttle valve to the idle position in the event that, for example, either the first throttle return spring or the associated throttle control linkage should fail while the throttle valve is in either a partly or fully opened position.

3,698,373

FUEL INJECTION SYSTEM FOR DIESEL ENGINE

Shigeo Nagasawa, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

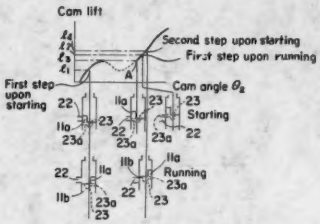
Filed Dec. 22, 1969, Ser. No. 886,960

Int. Cl. F02b *3/00;* **F02n** *17/00*

U.S. Cl. 123—32 G **1 Claim**

A fuel injection system for a diesel engine has a plunger barrel with a fuel intake port and a plunger slidable axially in the barrel. A plunger operating cam has a pair of lobes for operating the plunger. During either the intake or the compression stroke, the cam advances the plunger to a first position blocking the port to inject fuel, after which the plunger retracts. At the end of the compression stroke, the cam advances the plunger further to a second position to block the port to inject fuel.

A switching device is effective to rotate the plunger between a starting position and a running position. In the start-



ing position, the peripheral surface of the plunger blocks the port during the two fuel injections strokes of the plunger and, in the running position, the plunger is rotated to a position where its peripheral surface blocks the port only upon the further advance of the plunger to the second position. The invention improvement comprises at least one fuel passage in the plunger connecting the peripheral surface to the inner end face of the plunger and communicating with the port, during starting of the engine, and in the second plunger position.

3,698,374

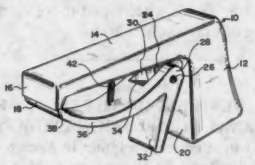
BALLOON GUN AND GAME

Le Roy V. Casper, 3740 West Wrightwood, Chicago, Ill.

Filed July 22, 1971, Ser. No. 165,275

Int. Cl. F41b *11/00*

U.S. Cl. 124—11 **9 Claims**



A toy gun capable of releasing inflated balloons for erratic flight to a target is disclosed. The gun has a pair of spring biased jaws which grip the neck of a balloon and hold it in inflated condition. One jaw is pivoted by a trigger away from the other to release the balloon. In one embodiment the gripping portions of the opposing jaws are themselves individually pivoted to hinge outwardly from a stop position for friction free release of the balloon and have conforming concave faces to provide a recess to aid in supporting the inflated balloon. The lower jaw can have a forward lip to support the balloon. A basket target is provided to catch the balloon in its flight and score a hit.

3,698,375

ARCHERY BOW WITH ARROW SUPPORT STRUCTURE

George D. Brougham, R.D. 2, P.O. Box 37, Gillett, Pa.

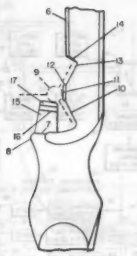
Filed July 31, 1970, Ser. No. 59,934

Int. Cl. F41b *5/00*

U.S. Cl. 124—24 **1 Claim**

An archery bow with an arrow supporting member so configurated that the feathers on the rear end of the shaft of an arrow will not touch any part of the bow when the arrow is

shot. The bow is provided with an arrow supporting member which is in the form of a pad that has the basic configuration of a trapezoid when the aforesaid bow is viewed in the shooting position. The aforesaid arrow supporting member is rectangular in shape when viewed from the side and has a convexed top on which is secured a standard adhesive backed



arrow rest on which is placed the arrow for shooting. The bow has V-shaped recesses in the portion of the bow forming the bow window to receive fletches of an arrow in order that the feather of the arrow will pass free of the bow when shot. The portion of the bow between the V-shaped recesses is a flat surface against which an arrow rests when supported on the arrow support member.

3,698,376

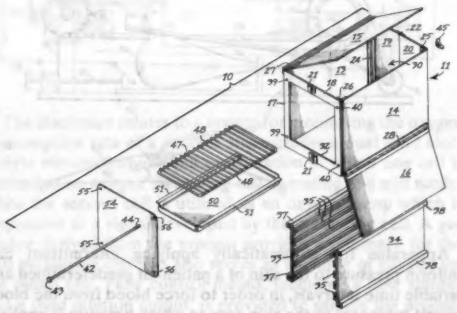
PORTABLE COOKING STOVE

Louis R. Webb, 1108 Batey Drive, Nashville, Tenn.

Filed July 6, 1971, Ser. No. 159,794

Int. Cl. F24c *1/16*

U.S. Cl. 126—9 R **10 Claims**



A portable cooking stove including a cooking chamber having interior removable side guide panels. The assembled guide panels have opposed parallel pairs of slide rails adapted to receive food receptacles or fuel receptacles having opposite side portions or flanges slidably engaging the rails. The slide panels are also provided with longitudinal rod guide members, preferably tubular, for removably receiving elongated rods, which are also received through aligned holes or openings in the front and rear walls of the chamber.

The stove also preferably includes front, back, side, top and bottom walls hinged together for collapsing into a dis-assembled position for storage or transportation.

3,698,377

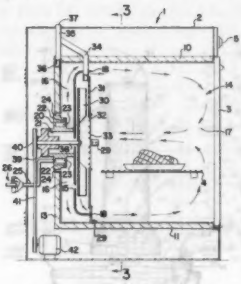
GAS-FIRED FORCED CONVECTION OVENS

Anthony Smith, Marlow Bottom, England, assignor to The Hoover Company, North Canton, Ohio

Filed May 7, 1971, Ser. No. 141,280

Int. Cl. A21b *1/26*; F24c *15/32*

U.S. Cl. 126—21 A **5 Claims**



In the preferred form, the present invention concerns a gas oven having a cavity including a rear wall, a gas burner mounted on the rear wall, a flow former spaced forwardly of the rear wall so as to form a combustion chamber between the flow former and the rear wall, a cooking chamber forward of the flow former, a blower mounted immediately forward of the flow former which causes recirculative gas flow through the cooking chamber and aids the passage of combustion chamber gases from the combustion chamber around the peripheral edge of the flow former.

3,698,378

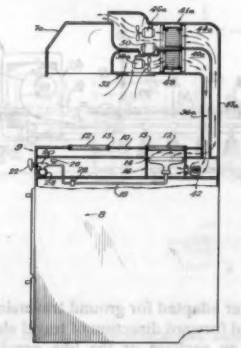
SMOOTH TOP GAS RANGE

Robert B. Rosenberg, Evergreen Park; Esher R. Kweller, Downers Grove, and William R. Staats, Chicago, all of Ill., assignors to Institute of Gas Technology

Filed July 12, 1968, Ser. No. 744,582

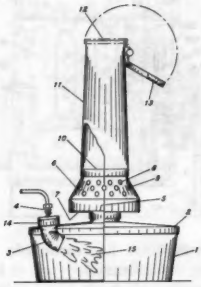
Int. Cl. F24c *3/00*, *15/20*

U.S. Cl. 126—39 R **26 Claims**



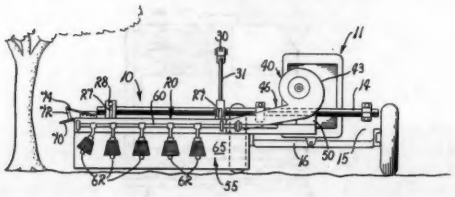
A smooth top gas range which includes a hood that draws cooking vapors and fumes and air into a regenerative type heat exchanger for preheating prior to combustion with gas at the burner surface unit. Each burner unit is enclosed in a separate combustion compartment with heat being transmitted to a cooking vessel through an air impervious compartment wall or plate by means of radiation. The combustion products exhaust from the combustion compartment, are cooled to a safe temperature by the heat exchanger and are finally vented to the room.

3,698,379
ORCHARD HEATER
Harold L. Cheney, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Oct. 12, 1970, Ser. No. 80,886
Int. Cl. A01g *13/06*
U.S. Cl. 126—59.5 **6 Claims**



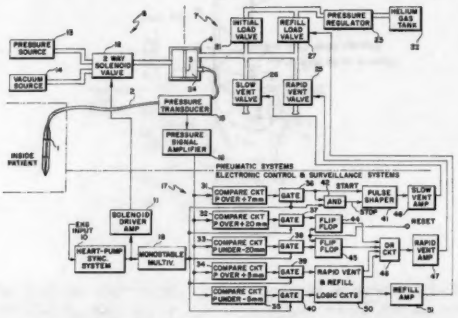
An orchard heater is provided which has improved combustion properties and, consequently, reduced soot deposit problems. The orchard heater is provided with a primary combustion chamber, a stack mounted thereon and an air-fuel mixer in combination with directional means which directs the primary combustion flame to more evenly distribute the heat generated thereby insuring complete combustion and little, if any, build-up of soot.

3,698,380
WEED BURNER
Einar Cook, 4160 East Shaw Avenue, Fresno, Calif.
Filed Jan. 8, 1971, Ser. No. 105,009
Int. Cl. A01m *15/00*
U.S. Cl. 126—271.2 A **12 Claims**



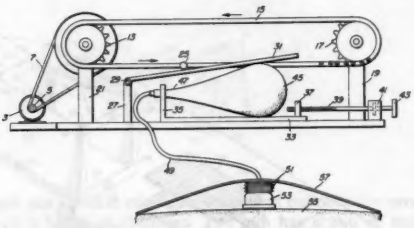
A weed burner adapted for ground traversing movement in a predetermined forward direction of travel along the berm of a tree line in an orchard or the like providing a housing disposed in predetermined elevationally spaced relation to the ground forming a combustion chamber between the housing and the ground and having ignition means borne by the housing adjacent to the combustion chamber and blower means connected to the housing for producing a relatively high velocity airstream above the combustion chamber and outwardly from the housing in a laterally extended path relative to the direction of ground traversement of the burner so as to direct heat and smoke emanating from the combustion chamber transversely through the tree line and outwardly away from the foliage of the trees.

3,698,381
MONITORING SYSTEM FOR PHYSIOLOGICAL SUPPORT SYSTEMS
Armando Federico, Medford, and Henry R. Guarino, Revere, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio
Filed Dec. 30, 1970, Ser. No. 102,778
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **16 Claims**



A system for automatically monitoring and controlling the fluid load in physiological support systems. The system samples gas pressure at fixed periods and adds fluid or vents fluid from the system to prevent malfunction and the catastrophic results.

3,698,382
DEVICE FOR MEASURING VENO CAPILLARY FILLING TIME
William L. Howell, 3562 Macomb Street, Washington, D.C.
Filed Oct. 15, 1970, Ser. No. 80,845
Int. Cl. A61b *5/02, 6/08*
U.S. Cl. 128—2 R **9 Claims**



Apparatus for automatically applying intermittent and uniform pressure to the skin of a patient at predetermined and variable time intervals, in order to force blood from the blood vessels subjacent to the skin area to which pressure is applied, and further apparatus for measuring the rate of return of the blood into the collapsed blood vessels upon release of pressure from the skin.

3,698,383
RECIPIENT IDENTIFICATION
Keight K. Baucom, Ramsey, N.J., assignor to Baxter Laboratories, Inc.
Filed July 20, 1970, Ser. No. 56,524
Int. Cl. A61b *05/00*
U.S. Cl. 128—2 G **13 Claims**

An identification band, fastener and pilot tube for use in blood handling procedures to minimize blood transfusion er-

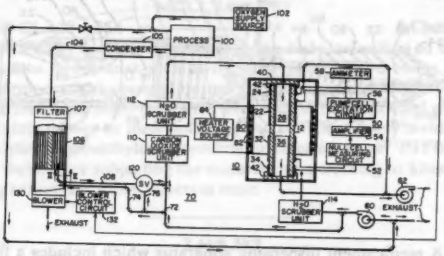
rors. The fastener and pilot tube are integrally connected to the band and the pilot tube is adapted for release through action of the fastener when forming the band into a bracelet on an extremity. The bracelet and pilot tube carry removable labels presenting like indicia.

3,698,384

OXYGEN CONSUMPTION RATE MONITOR

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1970, Ser. No. 86,491
Int. Cl. A61b *5/00*
U.S. Cl. 128—2.07 **4 Claims**



The disclosure relates to a system for monitoring the oxygen consumption rate of a process and includes a dual solid electrolyte electrochemical cell combination in which one cell is utilized as an oxygen measuring cell operating in a null mode, while the second cell is utilized as an oxygen pump which is responsive to a signal developed by the measuring cell. A gas source derived from the process provides a reference for the null measuring cell and also serves as a source of oxygen for the pump cell. Flow control means, including a flow splitter and a fluid dilution circuit, is provided to sample the process fluid and to maintain the sample flow and reference gas flow through the dual cell combination relatively constant.

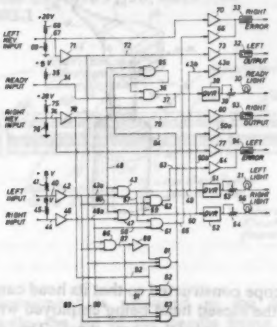
3,698,385

REACTION TESTER

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Harry H. Brown, 3012 Potshop Road, Norristown, Pa.

Filed Oct. 7, 1970, Ser. No. 78,717
Int. Cl. A61b *5/16*
U.S. Cl. 128—2 N **10 Claims**

A reaction tester is disclosed for testing the simple and disjunctive reaction of a subject to light stimuli. The embodiment disclosed is in the form of a bar member which has spaced grooves for receiving the index fingers of a subject. Near the bottom of each groove are openings aligned along a transverse axis to a groove and a light beam is projected through the openings to a photo transistor. The subject's finger breaks the light beam and when the finger is moved relative to the groove, the light beam actuates the transistor. A logic circuit is provided to interconnect the "reaction key," above defined, to a panel having neon light indicators. A "ready," "left" and "right" neon light indicators are selectively actuatable. The "ready" light informs the subject that the test will begin. Next, either the "left" or "right" or both lights are actuated through the logic circuit. A counter is started and when the subject reacts by moving the correct finger, the light indicator is extinguished and the counter is stopped. An incorrect reaction causes an error indicator to operate.

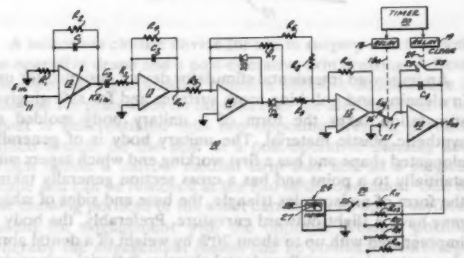


3,698,386

CARDIAC RHYTHM COMPUTER DEVICE

Robert Fried, 52 Herbert Drive, East Brunswick, N.J.

Continuation of Ser. No. 822,548, May 7, 1969, abandoned. This application July 16, 1971, Ser. No. 163,507
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **7 Claims**



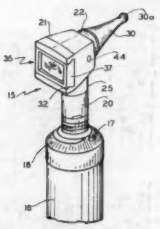
A device which monitors electrocardiac activity for providing direct and discrete output readings which simply and positively identify specific cardiac activity patterns. Samples are taken over predetermined time intervals during which the total number of cycles of the entire electrocardiac signal occurring during the time interval undergoes slope analysis for the purpose of providing in-line indices of the various cardiac arrhythmias. Mathematical manipulation of the electrocardiac signals (also referred to as EKG signals) are performed by analog circuit means to yield a direct output reading which, by providing an appropriate scale or by providing a chart usable in conjunction with the output meter, positively and directly provides an indication of the various cardiac arrhythmias.

3,698,387

OTOSCOPE CONSTRUCTION

William C. Moore, Skaneateles, and William S. Pilgrim, Port Byron, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,348
Int. Cl. A61b 1/22
U.S. Cl. 128—9 **1 Claim**



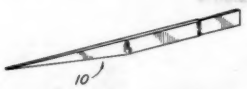
An otoscope constructed so that its head can be either open or closed, the closed head being employed when it is desired to introduce air into the ear canal. The otoscope has a generally rectangular shape and a large proximal end opening which is provided with a removable slide closure comprising a lens and lens frame of gasket material. The otoscope head and speculum portions are formed as a unitary member, and optical fibers are embedded therein to conduct light to the distal end of the speculum from a source removed therefrom.

3,698,388

INTERDENTAL STIMULATOR

Joseph C. Muhler, Indianapolis, Ind., assignor to Plastek Company, Sturgis, Mich.

Continuation of Ser. No. 798,883, Feb. 13, 1969, abandoned. This application Jan. 11, 1971, Ser. No. 105,691
Int. Cl. A61h 7/00
U.S. Cl. 128—62 A **17 Claims**



An improved interdental stimulator device designed for use in cleaning and polishing tooth surfaces and for safe gingival stimulation takes the form of a unitary body molded of synthetic plastic material. The unitary body is of generally elongated shape and has a first working end which tapers substantially to a point and has a cross section generally taking the form of an isosceles triangle, the base and sides of which may have a slight outward curvature. Preferably, the body is impregnated with up to about 20% by weight of a dental abrasive material, especially a dental abrasive material comprising zirconium silicate. The body may have at its other end a flat-sided projecting member as a second working end.

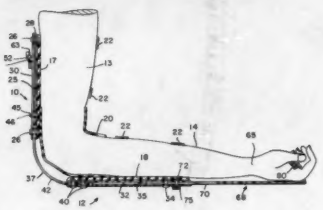
3,698,389

ELBOW LOCKING DEVICE

Arthur R. Guedel, Indianapolis, Ind., assignor to Guedel Company, Inc.

Filed May 21, 1971, Ser. No. 145,700
Int. Cl. A61f 5/10
U.S. Cl. 128—77 **13 Claims**

A device for releasably locking a person's elbow against bending, having a pair of hingedly connected shells adapted to be mounted on the user's upper arm and forearm. A bendable slide is mounted on one of said shells and is slidably carried in a guide on the other of said shells. Locking means are engaga-



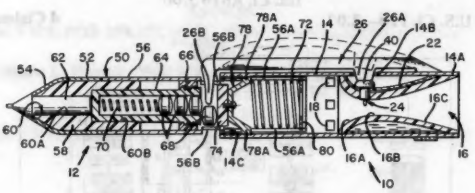
ble with the slide for releasably locking it in position in the guide and thereby releasably locking the shells and the user's arm against bending.

3,698,390

DISPENSING FOR MEDICAMENTS

Frank Donald Ferris, 5481 Plaza de Ray, San Jose, Calif.

Filed Oct. 27, 1969, Ser. No. 869,478
Int. Cl. A61j 07/00
U.S. Cl. 128—222 **5 Claims**



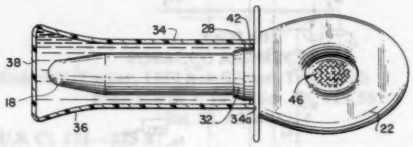
A medicament dispensing apparatus which includes a first housing and a nozzle of the convergent-divergent type having an inlet and outlet adjacent the opposite ends of a nozzle chamber. A reservoir for liquid medicament is located outside the nozzle chamber adjacent the throat of the nozzle, and a metering and dispensing valve is positioned adjacent the throat for injecting a measured amount of medicament from the reservoir into the nozzle. Upon inhaling at the outlet of the nozzle the medicament injected into the nozzle is drawn into the mouth of the patient. A tablet storage and dispensing device in a second housing is provided adjacent the inlet end of the nozzle and includes a tablet container within said second housing. A container closure member for the tablet container is carried by the first housing, and a resilient member normally urges the container and closure together in air-tight engagement. A resilient member inside the container urges a stack of tablets therein into engagement with the closure. When the container and closure are separated, a tablet actuating arm is movable across the inner face of the closure to remove a tablet therefrom. The tablet actuating arm is included on a movable actuating member which also includes a valve actuating arm for operation of said metering and dispensing valve. The tablet storage and dispensing means may be replaced by an aerosol container for injection of medicament therefrom at the inlet of the nozzle chamber from whence it may be drawn through the nozzle by inhalation of the patient.

3,698,391

MEATAL DILATOR

David T. Mahony, c/o Mahony Urology Assoc., Inc., 966 Park Street, Stoughton, Mass.

Filed Dec. 16, 1970, Ser. No. 98,844
Int. Cl. A61m *35/00, 29/00;* A61b *17/34*
U.S. Cl. 128—261 1 Claim



A meatal dilator designed specifically to dilate the urethra has a relatively long dilating shaft one of whose ends is tapered to a blunt tip. The other end of the shaft is connected to a grip designed to fit the hand. A protective diaphragm arranged perpendicularly to the shaft is interposed between the shaft and the grip to limit the depth of penetration of the dilator. Also, a generally cylindrical cap containing an antibiotic and/or lubricant is snugly engaged over the head of the shaft and removably held in place to protectively enclose the shaft.

3,698,392

TOPICAL DRESSING

John W. Vogt, South Russell, and Peter G. Schrier, Medina, both of Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

Filed April 21, 1971, Ser. No. 136,257
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 5 Claims

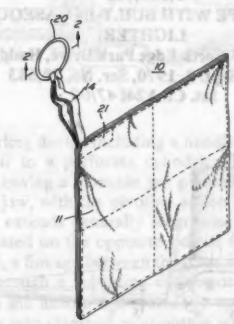
A topical dressing applicable to the body, as well as to the mucous membranes such as the oral cavity. The dressing or pharmaceutical preparation includes a physiologically active material, optionally combined with a solid, finely divided particulate carrier or inert material, and sufficient finely divided polytetrafluoroethylene (hereinafter referred to as "PTFE") to form, after subjecting the materials to a working or kneading action, a flexible, coherent mass.

3,698,393

SURGICAL PAD

Charles E. Stone, Douglaston, N.Y., assignor to Chaston Medical & Surgical Products, Inc., Plainview, N.Y.

Filed June 15, 1971, Ser. No. 153,216
Int. Cl. A61f *13/00*
U.S. Cl. 128—296 7 Claims



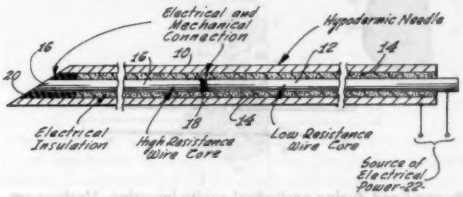
A surgical pad or sponge is provided which includes a central portion of absorbent gauze with a loop attached thereto with an attached plastic ring having irradiation opaque properties.

3,698,394

ELECTRICALLY HEATED HYPODERMIC NEEDLE

William S. Piper, 555 Greencraig Road, and Teodor Polak, 443 Greencraig Road, both of Los Angeles, Calif.

Filed June 14, 1971, Ser. No. 152,549
Int. Cl. A61b *17/36;* A61n *3/06*
U.S. Cl. 128—303.1 7 Claims



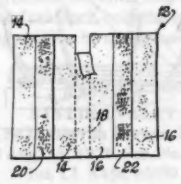
A surgical instrument is provided in the form of a hypodermic needle, the tip of the needle being heated by passing an electric current through a resistance wire within the needle adjacent its tip. The needle has particular utility for medical purposes, and is used, for example, to destroy blood vessels or tissue.

3,698,395

SURGICAL CLOSURE

Harrith M. Hasson, 6942 North Waukesha Avenue, Chicago, Ill.

Filed March 12, 1971, Ser. No. 123,559
Int. Cl. A61b *17/04*
U.S. Cl. 128—335 18 Claims



A sutureless closure device for use in surgery which is both an operative drape and a post-operative skin dressing. A flexible sheet having a pressure sensitive adhesive undersurface is adapted for placement on the skin over the area to be cut. The sheet is differentiated into two opposing dressing portions which remain on the skin as a post-operative dressing and which define a narrow median strip that acts as a surgical drape and can be removed at the end of the operation. One of the dressing portions of the sheet carries, on its upper surface, means for engagement with the opposite dressing portion whereby the engagement means can be connected to bridge the incision thereby forming a connected closure.

3,698,396

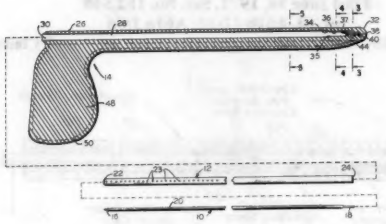
CATHETER ASSEMBLY FOR PERITONEAL CAVITY INSERTION

Dean R. Katerndahl, Wheaton; Earl D. Wilson, Ingelside; Fidel V. Macalalad, Lake Forest, and Gene C. Ring, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 4, 1970, Ser. No. 95,012
Int. Cl. A61b *17/34;* A61m *25/00*
U.S. Cl. 128—347 12 Claims

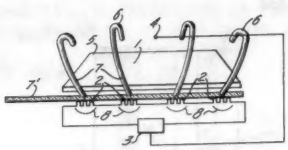
A catheter assembly for peritoneal insertion, including an elongated stylet, an elongated catheter slidably disposed

around the stylet and a gripping member secured to a proximal end of the stylet and having a handle grip extending transversely therefrom adjacent a shank of the stylet such that the handle grip may be grasped in the palm of one hand with the fingers grasping the catheter adjacent a distal end thereof whereby the catheter assembly may be firmly held and guided



with one hand during peritoneal cavity insertion. Various embodiments of the catheter assembly include an elongated barrel surrounding the catheter having a closed end anchored to the proximal end of the stylet, a stylet which is bent upon itself to form the gripping member, and a gripping member disposed parallel to the shank of the stylet and having an upper end bent upon itself and secured to the proximal end of the stylet.

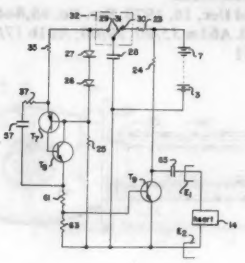
3,698,397
ENERGY TRANSMISSION APPARATUS
Irwin H. Franzel, 501 Linwood Drive, Fort Lee, N.J.
Filed Nov. 10, 1969, Ser. No. 875,018
Int. Cl. A61b *19/00*
U.S. Cl. 128—399 **6 Claims**



Energy transmission apparatus for controlling neonate body temperature consisting of a support platform for infant support, a heat source in proximity to the platform, energy guides surrounding the platform which transmit and guide heat energy from the heat source to the platform, and a heat control for controiling changes of the heat source in accordance with body temperature changes of the neonate in order to maintain the body temperature constant.

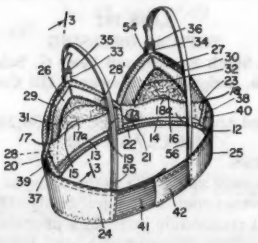
3,698,398
RATE-SCANNING PACER FOR TREATMENT OF TACHYCARDIA
Barouh V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Nov. 6, 1970, Ser. No. 87,387
Int. Cl. A61n *1/36*
U.S. Cl. 128—422 **8 Claims**

An externally activated implantable rate-scanning heart pacer. Apparatus is disclosed for supplying to the heart of a patient a burst of stimulating pulses in which each successive interval between pulses of the burst is different in duration from the next previous interval. All of these intervals can correspond to repetition rates that lie within the physiological heartbeat range of the patient. The pacer comprises terminals for connection to the heart, a controllable electrical stimuli generator controlled internally by a discharging capacitor and controlled externally by a magnet. The pacer is particularly applicable to the treatment of paroxysmal supra-ventricular



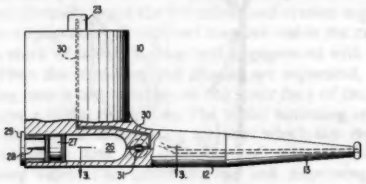
tachycardias, a rapid heartbeat condition originating in the atrium. The pacer can be temporarily activated by the patient.

3,698,399
BRASSIERE
Hi Hand, 16456 Sloan Drive, Los Angeles, Calif.
Filed Aug. 20, 1971, Ser. No. 173,429
Int. Cl. A41c *3/00*
U.S. Cl. 128—483 **4 Claims**



A brassiere having a pair of shaped elongated bust supporting straps for disposition below the bust of the user, and additionally having a flexible bust extending strip for encircling the upper portion of the bust attached to each bust support strap such that each of the bust extending strips is affixed to an opposite end of the associated bust supporting strap. Additionally, the brassiere has a pair of bust-shaping cups of flexible fabric secured to each bust supporting strap, and a means for adjustably securing a portion of each bust extending strip to the associated shaping cup.

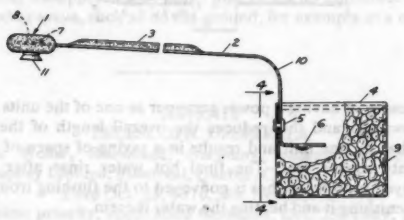
3,698,400
SMOKER'S PIPE WITH BUILT-IN GASEOUS FUEL LIGHTER
Hale E. Tucker, 625 North Edge Park Drive, Haddonfield, N.J.
Filed Sept. 9, 1970, Ser. No. 70,643
Int. Cl. A24f *47/00*
U.S. Cl. 131—185 **6 Claims**



A smoker's pipe has a built-in lighter system comprising a source of pressurized gaseous fuel, an igniter at the top of the

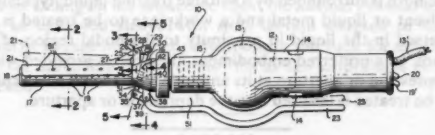
pipe bowl, a fuel gas conduit from the source to the igniter, and valve means operative both to control and to regulate ignition timing and the gas flow through the conduit. The igniter is of the battery electric type and is activated by a switch moving to closed position in response to movement of the valve means in performing its control function. In an alternative embodiment of the invention the igniter is of the piezoelectric type.

3,698,401
TOBACCO ASH RECEIVER
Robert V. Tucker, 1954 Axtell Road, Troy, Mich.
Filed March 1, 1971, Ser. No. 119,567
Int. Cl. A24f *19/14*
U.S. Cl. 131—235 R **1 Claim**



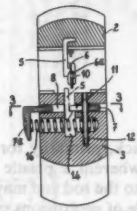
A tobacco ash receiver that is placed on top of an automobile instrument panel by means of a weighted T-shaped support member arranged to follow the contour of the dash panel. The lower end portion of the T-shaped member extends perpendicularly therefrom and terminates in an extinguisher. The upper portion of a wall of the receiver and said lower end portion are apertured to receive a rivet therethrough so that the receiver may be held in position approximately at eye level thus allowing his eyes on the road ahead. The receiver in this position is more readily accessible than the standard ash trays that come with the automobiles and especially the automobiles with no vent windows. It may be positioned center, left or right for maximum convenience.

3,698,402
HAIR CURLING DEVICE
Bernhard A. Arnesen, 67 Dartmouth Drive, Depew, N.Y.
Filed April 22, 1970, Ser. No. 30,791
Int. Cl. A45d *2/24*
U.S. Cl. 132—37 R **10 Claims**



A hair curling device including a handle providing a source of heated air to a perforate cylindrical fixed jaw attached thereto and having a movable jaw pivotally mounted relative to the fixed jaw, with the pivoting action being effected by a lever which extends generally lengthwise of the handle and which is located on the opposite side of the handle from the movable jaw, a linkage between the lever and the movable jaw extending through a mounting connector which mounts the fixed jaw on the handle and includes a spring for biasing the movable jaw into clamped relationship with the fixed jaw. A hair curling device of the foregoing type in which the jaws, lever, and linkage are mounted on a mounting connector which may be selectively mounted and demounted from a handle.

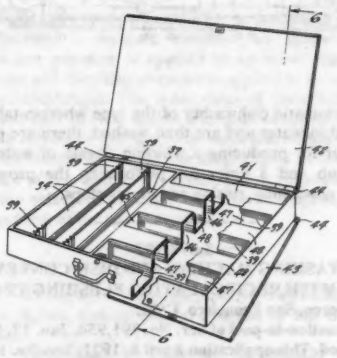
3,698,403
HAIR-SLIDE
Gilles Morand, 01 Ceyzeriat, France
Filed Feb. 24, 1972, Ser. No. 229,027
Claims priority, application France, June 28, 1971, 7124388
Int. Cl. A45d *8/00*
U.S. Cl. 132—46 R **4 Claims**



This hair-slide, notably of the "horse-tail," captive type, comprising two substantially arcuate elements hingedly interconnected and having their free ends provided with releasable locking means, the closed slide having a substantially elliptic configuration.

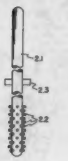
The releasable locking means comprise a hooking member carried by one element and engageable in a slot formed in the other element; the latter has formed across this slot another slot parallel to the hinge pin interconnecting said elements, in which a lock-bolt in the form of a plate formed with an L-shaped notch is slidably fitted and engageable by said hooking member; a pin parallel to said slot constitutes one stop means for limiting the permissible longitudinal movement of said lock-bolt in one direction, the other stop means consisting of a bent outer portion of said lock-bolt, the latter being constantly urged to its locking position by spring means.

3,698,404
STYLING VALET
Thomas E. Greco, 5421 Oberlin Avenue, Lorain, Ohio
Filed Aug. 25, 1970, Ser. No. 66,806
Int. Cl. A45d *40/00*
U.S. Cl. 132—79 R **1 Claim**



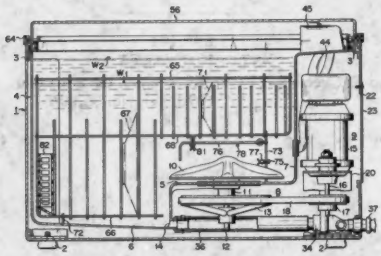
A carrying case for containing hair dressing equipment such as shampoo bottles, spray nets and the like, the carrying case being divided into a plurality of compartments for readily and quickly locating all objects placed therewithin.

3,698,405
ORTHODONTAL TOOTHPICK
Richard M. Walker, 50 Beacon Street, Chestnut Hill, Mass.
Filed April 8, 1970, Ser. No. 26,540
Int. Cl. A45d *44/18*
U.S. Cl. 132—84 **5 Claims**



An improved toothpick, primarily for use by orthodontal patients, is disclosed, wherein a plastic or metal rod has a resilient jacket bonded to the rod and may have over a portion of its surface a multitude of protrusions such as bristles, stubs, short filaments or filters extending radially outward from the surface. When the toothpick is inserted between adjacent teeth and passed therethrough several times, a virulent scrubbing action results which not only dislodges unwanted food particles but provides a massaging action for the gums. This massaging action aids in maintaining the gums in a healthy condition and also aids in preventing pyorrhea by preventing accumulation of plaque.

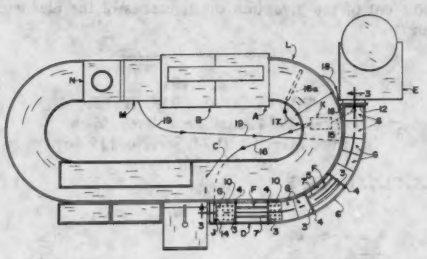
3,698,406
AUTOMATIC DISHWASHER
Hideo Sato, Nagoya, and Kunihiko Ito, Gifu-ken, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Jan. 15, 1971, Ser. No. 106,660
Int. Cl. B08b *3/02*
U.S. Cl. 134—57 D **12 Claims**



In an automatic dishwasher of the type wherein tablewares are soaked in water and are than washed, there are provided an impeller for producing a whirling stream of water in the washing tub and a timer for performing the programmed operation of washing, rinsing and drying steps.

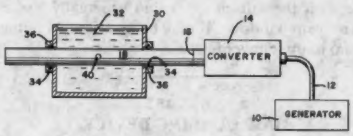
3,698,407
DISHWASHING MACHINE AND DISH-CONVEYING TABLE WITH RECIRCULATING FLUSHING TROUGH
Tore H. Noren, San Francisco, Calif.
Continuation-in-part of Ser. No. 791,954, Jan. 17, 1969, abandoned. This application April 5, 1971, Ser. No. 131,211
Int. Cl. B08b *3/02*
U.S. Cl. 134—60 **22 Claims**

A recirculating flushing trough for an oval-shaped dish-conveying means of the endless conveyor type for a dishwashing machine that reuses water to convey material removed from dishes to a waste receiving system, a part of the water also being used for a power scrapper to clean the dishes just prior to washing and rinsing them. This does away with the use of fresh water for the power scrapper and thus saves water. The use of a recirculating flushing trough does away with the



necessity of having a power scrapper as one of the units in the dishwasher and this reduces the overall length of the dishwasher by one unit and results in a saving of space of about twenty square feet. The final hot water rinse after being sprayed onto the dishes is conveyed to the flushing trough for replenishing it and heating the water therein.

3,698,408
ULTRASONIC PROCESSING APPARATUS
Stanley E. Jacke, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.
Filed June 11, 1971, Ser. No. 152,095
Int. Cl. B08b *3/10*
U.S. Cl. 134—122 **12 Claims**

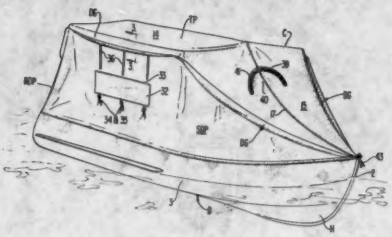


An apparatus for ultrasonically treating (e.g., cleaning, plating) a workpiece comprises a full wavelength resonator or horn supported at its nodal regions. The antinodal region of the horn is surrounded by a suitable treating liquid, typically, a solvent or liquid metal and a workpiece to be treated is immersed in the liquid in proximity to the nodal region of the horn. In a preferred embodiment, the horn is provided with a depression or aperture at its antinodal region and a workpiece to be treated is inserted into the depression or aperture.

3,698,409
PROTECTIVE COVER STRUCTURE
Raymond A. Koontz, R.D. 4, P.O. Box 239, and Walter H. Reese, 433 South Juliana, both of Bedford, Pa.
Filed Nov. 12, 1969, Ser. No. 875,627
Int. Cl. B63b *17/00*
U.S. Cl. 135—6 **7 Claims**

A protective cover of flexible material such as canvas or duck is mountable in raised position on a support to provide a top portion and depending portions covering and substantially enclosing an area to be protected. The depending portions may be adjustably positioned selectively to provide generally vertical openings in different parts of the cover. When in raised position, the cover material itself can be adjusted to provide a drainage gutter. The cover may also be conditioned

for being mounted in unraised, substantially flat condition for protecting an unoccupied area, such as in a boat when moored

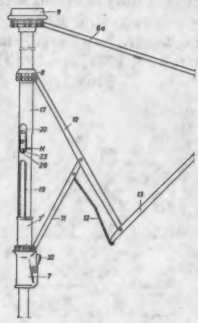


or being transported. The cover may be set up to protect various other areas, such as on the ground, for example at a camp site.

3,698,410
TELESCOPIC UMBRELLA

Heinz Weber, Rhineland, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed Oct. 23, 1970, Ser. No. 83,493
Claims priority, application Germany, Oct. 25, 1969, P 19 53 794.1
Int. Cl. A45b *19/04*
U.S. Cl. 135—26 **3 Claims**



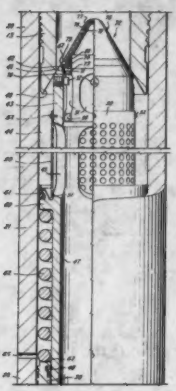
A telescopic umbrella having a main runner and an auxiliary runner sliding on the telescopic stick, the auxiliary runner having an extended sleeve with slots therein adapted to temporarily engage abutment projections in the stick for enhancing the spreading of the dome ribs as the umbrella is being opened.

3,698,411
KELLY FOOT VALVE

William R. Garrett, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed July 29, 1970, Ser. No. 58,824
Int. Cl. F16k *17/18, 17/40*
U.S. Cl. 137—71 **16 Claims**

A valve assembly to be disposed between lower end of kelly and upper end of drill string comprises a spring loaded upwardly closing, pressure release, poppet valve, the poppet including an upwardly opening check valve with a frangible closure for the passage of well tools. A foraminous skirt on the downstream side of the poppet provides a strainer for the drilling fluid. An annular flange carried by the skirt engages and seals with the inside of the valve housing to provide increased area subject to upstream pressure when the poppet opens, the housing being ported to atmosphere downstream of the flange and the skirt sealing with the housing below the port

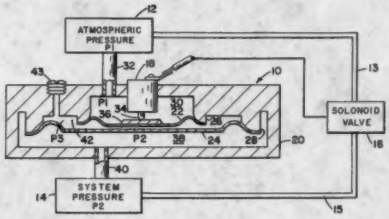


to prevent loss of drilling fluid. The spring is housed in the annulus formed between the skirt and housing.

3,698,412
DIFFERENTIAL PRESSURE CONTROL

Harold M. Smyly, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 26, 1970, Ser. No. 50,208
Int. Cl. F16k *31/42*
U.S. Cl. 137—81 **1 Claim**



A differential pressure control for activation in response to the difference in pressure between two applied pressures wherein one pressure is applied to an outer side of a first diaphragm and the other pressure is applied to an outer side of a second diaphragm. The inner sides of the diaphragms are positioned face to face within a central chamber to which is applied a reference pressure. An electrical switch is operated by the movement of one of the diaphragms in response to a difference in the applied pressures, which response is a function of the reference pressure, the ratio of diaphragm surface areas, and one of the applied pressures.

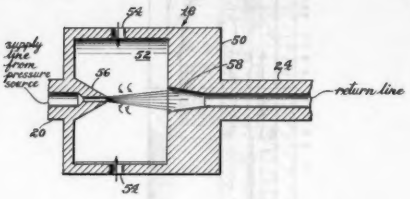
3,698,413
FLUIDIC FLUID METERING SYSTEM

Janusz S. Sulich, Detroit, Mich., assignor to The Bendix Corporation

Filed Sept. 15, 1969, Ser. No. 858,021
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **6 Claims**

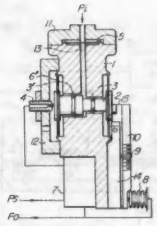
In a fluidic metering system having a return line, a means is provided of reducing or completely eliminating the back pressure effects of the fluid in the return line on the fluidic portion

of the system. The means comprise a jet pump operative to draw excess or unmetered fluid away from the fluidic portion



of the system and to provide the fluidic portion of the system with a stable back pressure.

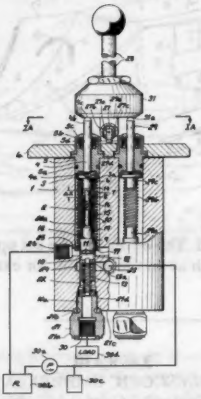
3,698,414
PRESSURE RESPONSIVE APPARATUS
Takeo Nagata; Masahiro Takasaka, and Ichiro Kimura, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 29, 1969, Ser. No. 888,568
Claims priority, application Japan, Dec. 27, 1968, 44/311
Int. Cl. G05d *16/00*; F15b *5/00*
U.S. Cl. 137—85 **9 Claims**



A pressure responsive apparatus having a differential piston operable in response to a measuring pressure, and elements for sealing a fluid which transfers the pressure to said piston. The apparatus is designed to detect said pressure in the form of a displacement of said piston.

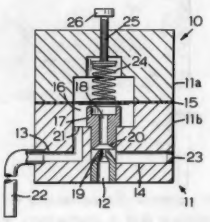
3,698,415
PRESSURE-REGULATING VALVE
Franz Forster, Haibach; Alfred Krusche, Grossostheim, and Gunter Hantelmann, Neuenrade, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany
Filed July 29, 1970, Ser. No. 59,081
Claims priority, application Germany, Aug. 1, 1969, P 19 39 293.9
Int. Cl. G05d *7/00*
U.S. Cl. 137—102 **4 Claims**

A pressure-regulating valve has a control member shiftable in a cylindrical bore of the valve housing by a lever or like actuator. The control member bears upon the valve body via a plurality of springs, at least one of which comes into play only



after the control member has been displaced through a predetermined extent.

3,698,416
FLUID OSCILLATOR AND PULSATING DENTAL SYRINGE EMPLOYING SAME
Clyde Chi Kai Kwok, Montreal, Quebec, Canada, assignor to Edward V. Rippingille, Jr., Key Largo, Fla.
Filed March 16, 1971, Ser. No. 124,905
Int. Cl. F16k *21/04*
U.S. Cl. 137—119 **6 Claims**



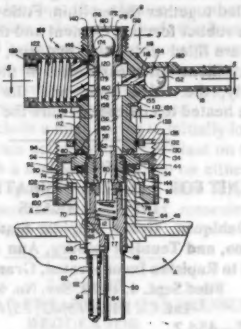
A fluid oscillator having a housing with a fluid inlet channel connected to a source of fluid under pressure, and first and second fluid outlet channels which communicate with the fluid inlet channel. A diaphragm is positioned so as to control the flow of fluid from the fluid inlet channel to the first fluid outlet channel. The second fluid outlet channel is connected to the fluid inlet channel upstream of the diaphragm, but the arrangement is such that the fluid flows through the first outlet channel when the diaphragm is in its open position. When the diaphragm is in its closed position, the fluid is diverted to the second outlet channel. The first outlet channel terminates in an end which is open to the atmosphere, and is dimensioned to produce an inertial effect in the fluid flowing through it. When the diaphragm moves to its closed position there is a momentary partial vacuum in the first outlet channel, which helps to hold the diaphragm firmly in its closed position. After the inertial effect has substantially dissipated, the force of the fluid against the diaphragm is sufficient to cause the diaphragm to return to its open position, whereupon the fluid resumes its flow through the first outlet channel.

3,698,417

KEG TAPPING DEVICE WITH AUTOMATIC GAS SHUTOFF VALVE

Vern Smith, Woodland Hills; Merton R. Fallon, Thousand Oaks, and Mack S. Johnston, Rolling Hills, all of Calif., assignors to Republic Corporation, Los Angeles, Calif.

Filed March 11, 1970, Ser. No. 18,476
Int. Cl. B65d *83/14*; B67d *5/54*
U.S. Cl. 137—212 7 Claims



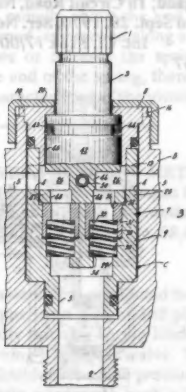
The device includes an adapter for semi-permanent securement within a keg opening and having liquid and gas passages with normally closed valves in the passages. A coupler is releasably secured to the adapter and has liquid and gas passages providing for ingress of gas under pressure through the coupler and adapter into the keg and egress of fluid under pressure from the keg through the adapter and coupler to a faucet. The coupler includes a gas shutoff valve having a piston member in the gas passage normally maintaining a ball valve spaced from its seat permitting flow of gas through the coupler. The piston, in response to gas pressure in the gas line in excess of a predetermined pressure, shifts to permit the ball to seal against its seat thereby precluding gas flow into the keg. A check valve is provided in the liquid line in the coupler to prevent backflow of liquid from a faucet through the coupler when the latter is uncoupled from the keg.

3,698,418

NON-RISE VALVE FOR FAUCETS OR THE LIKE

William C. Schmitt, Brown Deer, Wis., assignor to Milwaukee Faucets, Inc., Milwaukee, Wis.

Filed July 1, 1971, Ser. No. 158,886
Int. Cl. F16k *11/06*
U.S. Cl. 137—315 7 Claims



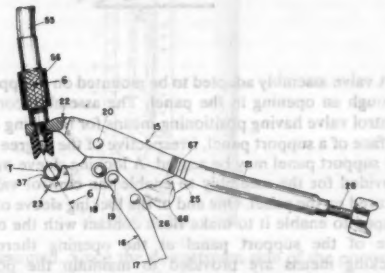
A valve for a water faucet or the like of the type which when actuated does not have a part that rises, and which valve includes a rotary sealing plate against which spring loaded seals cooperate to seal the valve when the plate is turned to the "off" position. The valve includes a cartridge which has a stem formed as one piece along with the rotary valve and which cartridge also has a sleeve in which the stem rotates. The assembled sleeve is formed of two sleeves which are held in assembled relationship by means of a recess and projection connection, thereby the upper sleeve can be easily moved axially from the lower sleeve when the valve is to be disassembled. The lower sleeve has a pair of circumferentially spaced slots which function both as a water passage and also as a stop for limiting the rotation of the stem within the assembled sleeve.

3,698,419

DEVICES FOR PIERCING TUBES IN CLOSED PRESSURE SYSTEMS

Natale G. Tura, 343 Griswold Street, N.E., Warren, Ohio

Continuation-in-part of Ser. No. 107,046, Jan. 18, 1971. This application May 11, 1971, Ser. No. 142,231
Int. Cl. F16e *41/04*; B23b *41/08*
U.S. Cl. 137—318 14 Claims



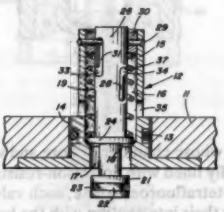
A device for use in the servicing of a sealed fluid system, such as a refrigeration or air conditioning system, comprising a plier-like tool, preferably of the Vice-grip type, one jaw having a cradle for receiving a part of the peripheral wall of a tube in the system, and the other jaw having a piercing needle for piercing a hole in the wall portion of the tube opposite to that being cradled. A resilient bushing seal surrounds the piercing needle and is compressed between the jaw carrying the needle and the tube wall surrounding the pierced hole to prevent leakage of fluid during the piercing operation. A lever is provided for pivotal connection to the pliers tool for squeezing the tubing closed at either side of the pierced hole so that the tool may be removed without loss of fluid from the system.

3,698,420

DRAIN VALVE HAVING AUXILIARY SEAL

Douglas Grundy, East Islip, and John E. Wills, Brightwaters, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 5, 1968, Ser. No. 781,487
Int. Cl. F16k *31/528*, *43/00*
U.S. Cl. 137—329.06 4 Claims



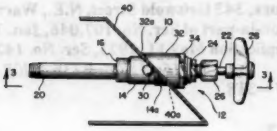
A drain valve having a spring-biased poppet which has a first seal on one end for closing an aperture and a second seal

spaced apart from said first seal for closing said aperture while said first seal is being replaced, and means for selectively positioning said first and second seals in sealing relation with said aperture.

3,698,421
VALVE ASSEMBLY

Samuel D. Kersten, Jr., Highland Park; Alton F. Sautter, Chicago, and John M. Simon, Downers Grove, all of Ill., assignors to Water Saver Faucet Co., Chicago, Ill.

Filed Sept. 30, 1971, Ser. No. 185,156
Int. Cl. F16l *5/00*
U.S. Cl. 137—356 **9 Claims**

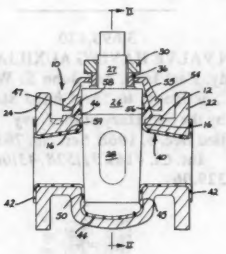


A valve assembly adapted to be mounted on a support panel through an opening in the panel. The assembly comprises a control valve having positioning means for engaging the inner surface of a support panel, irrespective of the degree at which the support panel may be angled. A locking sleeve or collar is provided for the assembly to enable the control valve to be secured on the panel. One end of the locking sleeve or collar is shaped to enable it to make flush contact with the outer surface of the support panel at the opening therethrough. Locking means are provided to maintain the positioning means and the locking sleeve or collar in locked engagement on the support panel.

3,698,422
LINED PLUG VALVE

Jacob B. Freed, Battle Creek, Mich., and Victor G. Reiling, Dayton, Ohio, assignors to Union Pump Company, Battle Creek, Mich.

Filed May 6, 1970, Ser. No. 35,016
Int. Cl. F16k *27/00*
U.S. Cl. 137—375 **26 Claims**

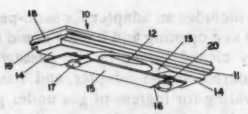


A plug valve whose chamber or bore and whose runs or port passages are fully lined with corrosion-resistant material, most preferably polytetrafluoroethylene, such valve having recesses in its runs, near their intersection with the bore, into which lining material distended by heat and pressure may creep, and with the valve body defining an internally rounded concave wall or dome at the bottom of the bore. The lining material is formed within the runs so as to be under tension longitudinally between the bore and the outer ends of the runs, and the lining material extends integrally upwardly from the bore and outwardly of the valve body to define a thick collar immediately above the neck of the bore. The valve is manufactured by use of an integral hollow rubber or like forming element comprised of tubular legs, and is placed inside the valve body with one such tubular leg extending through each run and through the bore. Different components of a multi-part mandrel are then inserted inside the tubular legs of the forming element and assembled together therewithin. Following this, the space between the rubber forming element and the inner walls of the valve body are filled with lining material, which is then compacted by resilient outer expansion of the forming element. Subsequently, the valve body and the compacted lining material are heated to coalesce or cure the latter in place.

3,698,423
VALVE UNIT FOR VACUUM OPERATED PALLETIZER LIFTING HEADS

Ernst A. Dahlquist, Grand Rapids; Stanley J. Polakowski, Kalamazoo, and Teunis Vaalburg, Ann Arbor, all of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Sept. 4, 1970, Ser. No. 69,688
Int. Cl. F16k *15/02, 15/14*
U.S. Cl. 137—454.2 **6 Claims**

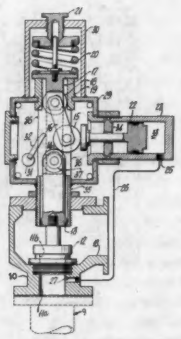


A valve unit adapted for insertion in an air passage opening through the grid of a vacuum operated palletizer lifting head having a rectangular body with a pair of elongated faces on opposite sides thereof and a generally central aperture therethrough between the elongated faces to permit air to pass through the body. The body has in one of its elongated faces a concave valve seat surrounding the aperture. The valve unit also has a valve member and means movably supporting the same on the body adjacent the valve seat, the valve member being a thin, resilient element adapted to be flexibly shiftable between an open position spaced from the valve seat and a closed position seated against the valve seat and shaped to conform to the concavity thereof. Means are provided around the periphery of the body for forming a seal between the body and the grid of the palletizer.

3,698,424
PRESSURE CONTROL VALVE

Charles W. Wiegand, 18 Circuit Road, New Rochelle, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,011
Int. Cl. F16k *17/00*
U.S. Cl. 137—467 **4 Claims**



A valve operable to open when a predetermined fluid pressure value is applied comprising a valve body having a passage

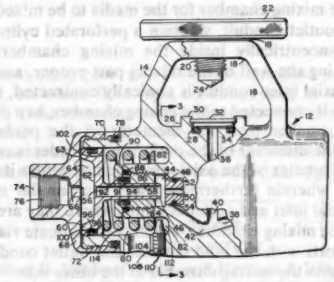
way, a closure member for controlling the flow, a control spring initially shouldered on a fixed abutment, a pendulant type member operatively pivoted to the shouldered end of the spring with the free end of the pendulant engaging a convexed surface on the closure member initially at a point tangential to its axis, a pressure responsive means when pressurized engages the free end of the pendulant urging it toward the axis of the closure member and by cam action raising the spring from its abutment thereby loading the closure member. When a predetermined pressure value is reached, the free end of the pendulant is pushed by the pressure responsive means beyond the axis of the closure member returning the spring to its fixed abutment and concurrently releasing the spring force on the closure member permitting the valve to open.

The valve may include a main spring to initially load the closure member. The cam action of the pendulant on the control spring would furnish a supplemental force on either the valve stem or the main spring and release this force when a predetermined pressure value is reached, returning the control to the main spring in the valve.

3,698,425
ADJUSTABLE BREATHING GAS PRESSURE REGULATOR

John A. Fisher, Fountain Valley, Calif., assignor to U.S. Divers Company

Filed Feb. 3, 1970, Ser. No. 8,268
Int. Cl. F16k *31/365*
U.S. Cl. 137—505.25 **5 Claims**



An adjustable breathing gas pressure regulator comprising means for connecting a pressurized gas source to a chamber having a spring biased piston therein with a hollow stem for gas passage, terminating in a valve surface for closure with an adjacent seat. The spring bias on the piston is externally adjustable by radially positioned threaded members which have tapered ends spaced radially about the end of the spring so that when they are turned, and moved along a radius, the taper effectively compresses or releases the spring by a general wedging action at the end of the spring, thereby changing the operative pressure characteristics of the piston.

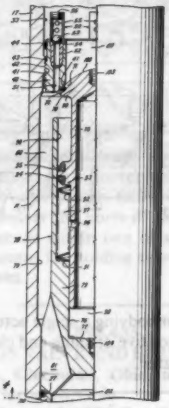
3,698,426
MUD SAVER VALVE AND METHOD

Mason Rawleigh Litchfield, and Floyd Logan Scott, Jr., both of Houston, Tex., assignors to Smith International, Inc.

Filed July 29, 1970, Ser. No. 58,825
Int. Cl. F16k *3/02*
U.S. Cl. 137—512.1 **28 Claims**

A mud saver valve assembly is connected between the lower end of the kelly and uppermost joint of drill pipe, the assembly including a downwardly opening spring loaded poppet valve and an upwardly opening ball check valve. The downstream face of the poppet is shielded from line pressure by a sealed air chamber at atmospheric pressure in such a manner that the resultant force of downstream pressure on the poppet tends to open the poppet.

Before adding another joint to the drill string the mud pump is shut down and the pressure gage checked to make sure there is no pressure in the drill string, any pressure in the drill string being transmitted through the ball check valve. If there is pressure it is bled off through a bleed off valve, if possible. With pressure down, the connection between the mud saver valve assembly and drill string is broken and a connection is made between the mud saver valve assembly and a joint of pipe in the mouse hole. No mud escapes from the kelly since the hydrostatic head of mud in the kelly is not sufficient to open the poppet valve in the mud saver valve assembly. The added joint of pipe is connected to the drill string still in the hole and the mud pump is turned on, automatically opening the poppet valve to restore circulation. The new joint is checked for leaks and if okay the drill string is lowered and

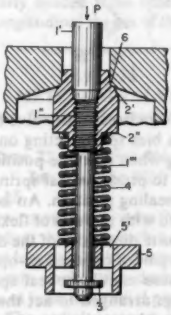


drilling resumed. Since the downstream side of the poppet is shielded from mud pressure the pressure drop across the valve need not equal the spring force to hold the valve open, whereby pump horsepower is not wasted and whereby rapid valve erosion is eliminated. If on opening the bleeder valve, drill string pressure is not relieved, it is possible to close the blow out preventers and reverse circulate to kill the pressure in the formation, the poppet valve being full open under well pressure thereabove in the kelly transmitted by the ball check valve, the atmospheric chamber below the poppet enabling the poppet to stay open when there is well pressure in the kelly sufficient to overcome the spring bias tending to close the poppet.

3,698,427
FLUID FLOW CONTROL VALVE

Frank Baranowski, Jr., 7 Pine Street, Lynnfield Center, Mass.

Filed Dec. 11, 1970, Ser. No. 97,276
Int. Cl. F16k *15/00, 21/02, 17/00*
U.S. Cl. 137—542 **4 Claims**



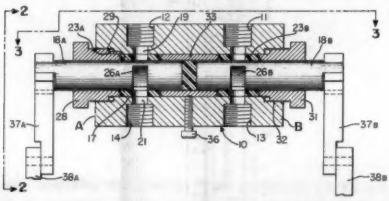
A valve including a valve element and valve stem unit is adapted to control a flow of fluid with a high degree of preci-

sion. The final configuration of the valve element is established by its engagement under pressure with the valve seat, resulting in cold flow, or creep, of the synthetic material of which the valve element is made. The valve element is joined to its stem by a screw-thread and without resorting to any adhesive bonding means.

3,698,428
VALVE ASSEMBLY

Darrell L. Gastin, Logan, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed March 22, 1971, Ser. No. 126,767
Int. Cl. F16k *11/10*
U.S. Cl. 137—595 **1 Claim**



A valve assembly embodying a single actuator for two valve elements permitting positive opening and closing under actuation of the single actuator.

3,698,429
GAS TIGHT ISOLATORS AND VALVES

Walter Max Lowe, and Frederick Squirrell, both of London, England, assignors to Thermo-Technical Development Limited, London, England

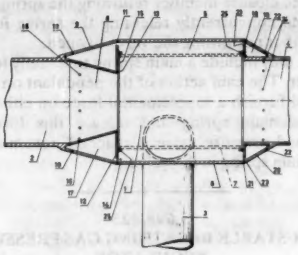
Filed Feb. 1, 1971, Ser. No. 111,542
Claims priority, application Great Britain, Feb. 6, 1970, 5,918/70; March 18, 1970, 12,919/70
Int. Cl. F16k *11/14*
U.S. Cl. 137—601 **10 Claims**

A cantilever seal for an isolator or valve comprises a cantilever leaf spring and a bias spring acting on the leaf spring to tension the leaf spring when in a free position, the bias spring being itself tensioned to press the leaf spring against a seating when the seal is in a sealing position. An isolating valve for a flue or duct is provided with two sets of flexible cantilever leaf springs facing in opposite directions of the duct, the cantilever leaf springs forming a pair of opposed co-operating seals when the duct is closed; these cantilever leaf springs may be provided with bias springs arranged to act thereon as described above. Preferably the bias spring or springs cause the leaf spring to have a curved cross section in the free position, and the leaf spring is flat in the sealing position.

3,698,430
MIXING DEVICE FOR MIXING TWO MEDIA WITH GREATLY DIFFERENT TEMPERATURES

Max L. G. Van Gasselt; Pieter A. Van Rijs, and Willem J. Basting, all of Apeldoorn, Netherlands, assignors to N.V. Neratoom, The Hague, Netherlands

Filed July 22, 1969, Ser. No. 843,634
Claims priority, application Netherlands, July 26, 1968, 6810707
Int. Cl. E03b *7/09*; F17d *1/16*
U.S. Cl. 137—604 **6 Claims**

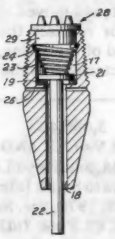


A mixing device for mixing two media of greatly different temperatures, especially for mixing liquid metals such as sodium, comprising a cylindrical mixing chamber having an axial inlet conduit and an inlet conduit connected transversely to the wall of the mixing chamber for the media to be mixed, and also an axial outlet conduit, wherein a perforated cylinder is positioned concentrically inside the mixing chamber, this cylinder forming the wall of the mixing part proper, and also wherein the axial inlet conduit is conically contracted, at the place where it is connected to the mixing chamber, to a diameter which is smaller than the diameter of the perforated cylinder and the diameter of the perforated cylinder is at least equal to the diameter of the axial inlet conduit before its contraction, and wherein furthermore there are annular spaces around the axial inlet and outlet conduits where they are connected with the mixing chamber, which communicate via relatively small ports with the inlet conduit and outlet conduit at one side and with the mixing chamber at the other side.

3,698,431
WATER DISPENSER FOR ANIMALS

Earl Clayton Thompson, Drawer A, Dallas, Tex.

Filed July 12, 1971, Ser. No. 161,532
Int. Cl. A01k *7/00*
U.S. Cl. 137—604 **15 Claims**



A dispensing valve for attachment to a water conduit includes an elongated housing having an external pipe thread at its inlet end. The housing provides an enlarged inlet chamber opening to the inlet end, and an axially aligned outlet passage of smaller diameter, defining an intermediate transverse shoulder. An annular gasket positioned on the shoulder defines a valve seat; and a closure member includes a head seating on the valve seat gasket and an elongated shank extending through the outlet passage and beyond the outlet end

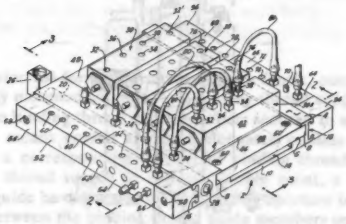
of the housing. The valve is opened by either tilting or lifting the closure member which is held against the seat by a spring in the inlet chamber. An orifice cap of a plastic material, for example, closes the inlet end of the inlet chamber and includes one or more bosses providing inlet passages. The bosses may be selectively sheared to change the area of the inlet passages.

3,698,432

FLUID LOGIC MODULE ASSEMBLY WITH BUILT-IN MANIFOLD

Aaron Kutz, Forest Hills, N.Y., assignor to Fluidic Controls Corporation, Hackensack, N.J.

Filed Oct. 8, 1970, Ser. No. 79,203
Int. Cl. F17d *1/00*
U.S. Cl. 137—608 **4 Claims**



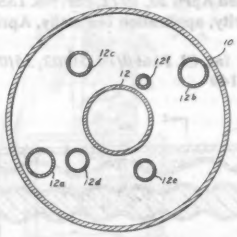
A mounting base with a built-in manifold passage is provided, on which fluid logic modules, such as valves, control relays, fluid interconnection elements and the like may be mounted in various combinations and arrangements as desired, means being provided for ready fluid interconnection between the manifold and appropriate fluid logic modules.

3,698,433

FLUID-SWIVEL

Christian D. Dobler, Tustin, and Herbert J. Lilly, Jr., Mission Viejo, both of Calif., assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Sept. 11, 1969, Ser. No. 857,073
Int. Cl. F16l *5/00, 27/06*
U.S. Cl. 137—615 **6 Claims**



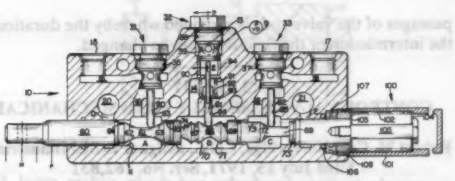
The disclosed multi-line fluid-swivel comprises a drum-like structure with the various lines entering the drum, and being directed to respective apertures in the drum-wall. Each aperture has an individually-associated peripheral rotatable manifold, so that each incoming line has fluid communication with a respective manifold. Each manifold is individual; and may be installed, removed, and repaired without interference of or from the others.

3,698,434

HYDRAULIC DIRECTIONAL CONTROL VALVE

Vaughn A. Nelson, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 840,647, July 10, 1969, abandoned. This application April 1, 1971, Ser. No. 130,443
Int. Cl. F16k *11/02*
U.S. Cl. 137—624.27 **8 Claims**



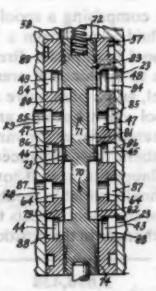
A directional flow control valve for controlling fluid flow between a source of fluid energy and a hydraulic motor having a valve housing, intake ports, motor ports, and exhaust ports, control means movable within said valve housing so as to selectively interconnect the ports of said valve housing, and flow responsive means within one of said ports, engageable with the control means for holding same in the selected position until flow ceases.

3,698,435

MULTISECTION VALVE AND HOUSING THEREFOR

Wendell I. Evans, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed March 15, 1971, Ser. No. 124,164
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.18 **4 Claims**



A valve mechanism has a single bushing and spool containing a plurality of separate valve functions. Each valve function is a section angularly spaced from other valve function sections in the same longitudinal region of the bushing and spool.

3,698,436

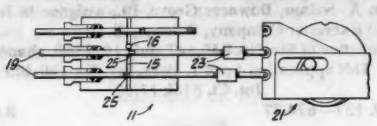
METERING VALVE

Charles H. Williams, Export, Pa., assignor to Koppers Company, Inc.

Filed June 22, 1971, Ser. No. 155,478
Int. Cl. F16r *3/24*
U.S. Cl. 137—624.15 **12 Claims**

A metering valve comprises a valve block that has at least one fluid carrying duct through which a pressurized fluid may flow and that has at least two valve ducts intersecting the fluid carrying duct wherein each valve duct carries a valve rod. Each valve rod has at least one radial passage in the form of a groove or a bore. The radial passages of each valve rod are disposed in a fixed relationship to each other and are capable of reciprocating across the fluid carrying duct as a unit for in-

termitting the fluid flow through the fluid carrying duct. A means for changing the fixed relationship between the radial



passages of the valve rods is provided whereby the duration of the intermission of the fluid flow can be changed.

3,698,437

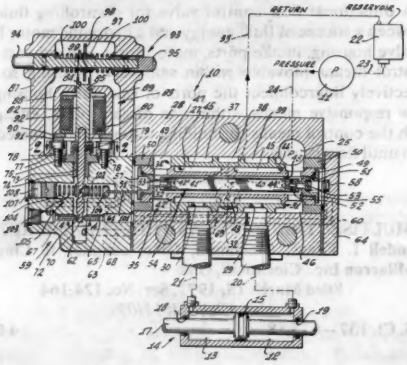
CONTROL VALVE ASSEMBLY WITH MECHANICAL FEEDBACK

Robert M. Cox, Northridge, Calif., assignor to SLI Industries

Filed July 15, 1971, Ser. No. 162,831

Int. Cl. F16k *11/07, 31/04*

U.S. Cl. 137—625.62 **17 Claims**



A valve assembly comprising a spool valve for controlling flows of actuating fluid to and from a hydraulic cylinder by movement of the spool in opposite directions from a neutral position in response to unbalanced pressures in chambers at the ends of the spool, and a pilot valve assembly mounted on the end of the spool valve housing and including an electromagnetically actuated flapper for variably restricting flows from the end chambers. Two balanced springs engage opposite sides of the flapper to urge it toward a centered position, and a longitudinally slidable feedback pin between one spring and the end of the spool adjusts the force of the spring in accordance with changes in the position of the spool.

3,698,438

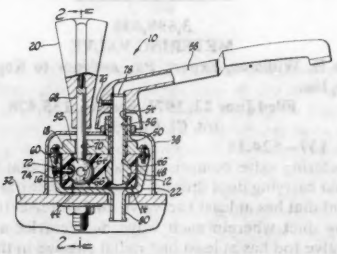
VALVE ASSEMBLY

Walter J. Rozmus, Hubbardsville, N.Y., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed July 22, 1970, Ser. No. 57,215

Int. Cl. F16k *11/06*

U.S. Cl. 137—625.46 **22 Claims**



A single handle mixer valve comprising an elastomeric body which sealingly supports a spherical valve member for rotation about two mutually perpendicular axes to regulate degree and balance of flow between two fluid inlets and an outlet. Three embodiments are disclosed.

3,698,439

DISTRIBUTING SLIDE VALVE FOR LABORATORY PURPOSES

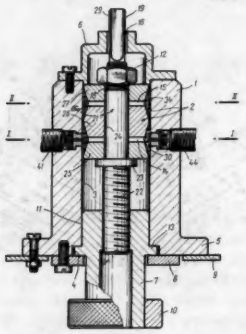
Miloslav Kolinsky, Praha, Czechoslovakia, assignor to Ceskoslovenska Akademie ved, Praha, Czechoslovakia

Filed May 5, 1971, Ser. No. 140,434

Claims priority, application Czechoslovakia, May 8, 1970, 321770

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.48 **4 Claims**



A distributing slide valve comprises a spindle consisting of at least one pair of conical truncated discs secured on an actuating rod. The pair of discs defines in respect of the valve bore an annular space for receiving a sealing ring and pressure means are provided to apply a force to the discs and to urge the rings against the bore. Each ring contains a system of individual ducts adapted to establish fluid communications between a system of fluid conduits which are to be operated by a valve.

3,698,440

THERMALLY INSULATED CONDUIT

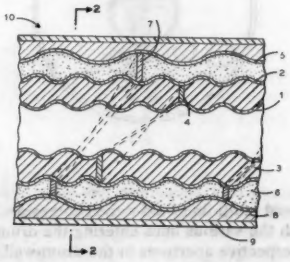
Paul Matthieu, Berlin; Ottmar Leuchs, Hannover; Fritz Glander, Isernhagen NB; Hubert Kuypers, Bad Nenndorf, and Diethart Pelz, Langenhagen, all of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed April 20, 1971, Ser. No. 135,585

Claims priority, application Germany, April 21, 1970, P 20 19 081.2

Int. Cl. F16l *9/14, 59/02, 55/04*

U.S. Cl. 138—149 **7 Claims**



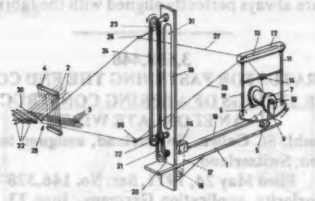
Thermally insulated conduit of indefinite length for transporting liquid or gaseous material in a heated or cooled state; the conduit including an oscillation damping layer.

3,698,441

DEVICE FOR FORMING A SELVAGE

Hubert Peter Van Mullekom, Deurne, Netherlands, assignor to N. V. Machinefabriek L. Te Strake, Deurne, Netherlands

Filed June 16, 1971, Ser. No. 153,607
Claims priority, application Netherlands, June 19, 1970, 7009073
Int. Cl. D03c *11/00*
U.S. Cl. 139—54 2 Claims



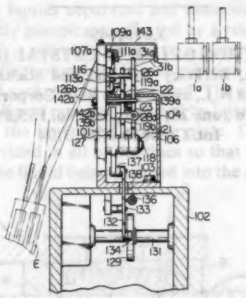
A device for forming a selvage with a fabric, comprising a rotatably mounted support for a binding thread supply and at least two binding thread guide members secured to an endless support means guided along an elongated endless path for guiding a corresponding number of binding threads from a binding thread supply to a fixed binding point, a common thread guide having a slot shaped guiding aperture being provided between the binding thread guide members on the one hand and the binding thread supply on the other hand, said guide being rotatably mounted in synchronism with the support means in its plane perpendicular to the plane of the support means, such that the distance between the support means and the adjacent end of the guiding aperture is minimum when the binding thread guide members are at or near the ends of their elongated path of movement.

3,698,442

WEFT CONTROLLER USABLE FOR A WEAVING LOOM OF WEFT PROPELLENT FLUID JET TYPE

Toemon Sakamoto, Hamamatsu, Japan, assignor to Enshu Limited, Hamana-gun, Shizuoka-ken, Japan

Filed June 18, 1971, Ser. No. 154,424
Int. Cl. D03d *47/34*
U.S. Cl. 139—127 P 6 Claims



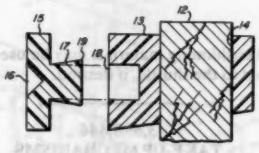
A weft controller usable for a weft propellant fluid jet type weaving loom, whereon two sets of wefts are picked alternately, having two sets of control mechanisms for pulling back the wefts after picking, clamping the wefts during the pulling back and releasing the wefts during the picking and a single driving source for the two control mechanisms. Control actions of the two control mechanisms can be varied from each other as desired.

3,698,443

LOOM PICKER

Richard J. Jacob, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed April 16, 1971, Ser. No. 134,561
Int. Cl. D03d *49/36*
U.S. Cl. 139—159 8 Claims



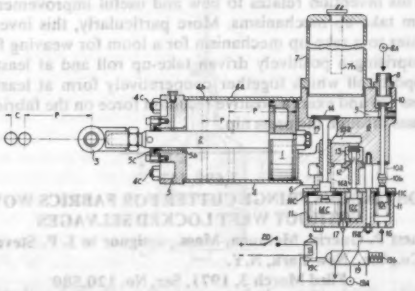
A loom picker which has a body of resilient elastomeric material with a shuttle-contacting insert of a wear-resistant material which is harder than the body. The inner end of the insert has an outwardly tapered configuration and is mounted in a cavity with a constant cross section so that the tapered end forces the material surrounding the cavity outward and creates a lock between the members. The cross section of the insert and cavity may have any of several conventional geometric shapes to prevent rotation of the insert in the cavity.

3,698,444

PNEUMATIC PICKING MECHANISMS

Thomas Hindle, and David Dugmore Banks, both of Blackburn, England, assignors to Hindle Son and Company Limited, Blackburn, England

Filed Aug. 20, 1970, Ser. No. 65,412
Claims priority, application Great Britain, Aug. 23, 1969, 42134/69
Int. Cl. D03d *49/34*
U.S. Cl. 139—142 21 Claims



A pneumatic picking motion for a weaving loom includes a linear-actuator comprising a piston movable in a cylinder under the influence of a measured change of compressed air applied thereto, the piston being connected with a picking-stick of the loom by means of a linkage. Preferably, the linkage is a compensating linkage arranged to provide uniformity of speed for the power-stroke of the piston.

3,698,445

LOOM SHUTTLE BINDER

Charles F. Travis, Greenville, S.C., assignor to Tranoco, Inc., Travelers Rest, S.C.

Filed March 11, 1971, Ser. No. 123,203
Int. Cl. D03d *49/54*
U.S. Cl. 139—185 2 Claims

A loom shuttle binder having a body portion formed entirely of compressed laminated wood. Metal and non-metal at-

tachment components are eliminated from the binder and

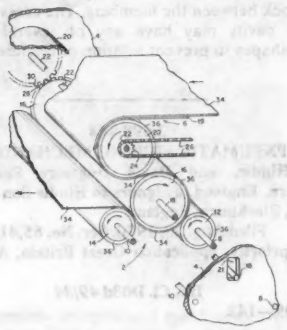
conventional cushioning materials may be used on the side of the binder next to the shuttle, if desired.

3,698,446

TAKE-UP MECHANISMS

Jarrell Miller, Denver, and Jimmy Talmage Whiteside, both of Greeneville, Tenn., assignors to Huyck Corporation, Stamford, Conn.

Filed Nov. 12, 1969, Ser. No. 875,875
Int. Cl. D03d *49/20*
U.S. Cl. 139—308 **11 Claims**



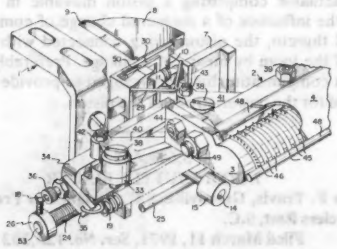
This invention relates to new and useful improvements in loom take-up mechanisms. More particularly, this invention relates to a take-up mechanism for a loom for weaving fabric comprising a positively driven take-up roll and at least one support roll which together cooperatively form at least one press nip and exert a positive resultant force on the fabric as it passes through the press nip.

3,698,447

CONTINUOUS FRINGE CUTTER FOR FABRICS WOVEN WITHOUT WEFT LOCKED SELVAGES

Ernest P. Guerin, Methuen, Mass., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed March 3, 1971, Ser. No. 120,580
Int. Cl. D03d *49/70*
U.S. Cl. 139—303 **6 Claims**



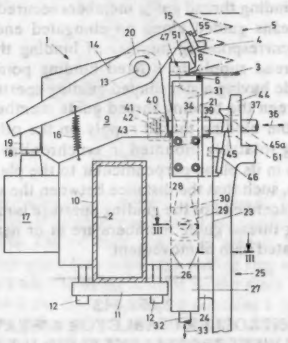
Woven fabrics in which wefts do not form weft locked selvages but are cut off at each pick, producing uneven weft fringes, are provided with two pairs of leno warp ends, one pair on each edge, spaced apart and preferably crossing every pick. The fabric is passed against two scissor-shaped cutters which, through suitable linkage, are actuated by the lay at the end of its travel in beating up a pick. These cutters cut the fabric between the two pairs of leno ends at each edge, removing a ragged fringe. To maintain the cutters close to the inner pair of leno ends at each edge, the fabric edge contacts a vertical guide which with the cutters can move a small distance parallel to the wefts. In other words, with the guide the cutters float and are always perfectly aligned with the fabric edge.

3,698,448

APPARATUS FOR FASTENING THE END COILS OF BORDER SPRINGS OF A SPRING CONSTRUCTION TO AN ELONGATE WIRE

Walter Spuhl, St. Gallen, Switzerland, assignor to Spuhl AG, St. Gallen, Switzerland

Filed May 24, 1971, Ser. No. 146,328
Claims priority, application Germany, June 23, 1970, P 20 30 793.1
Int. Cl. B21f *27/16*
U.S. Cl. 140—3 CA **11 Claims**



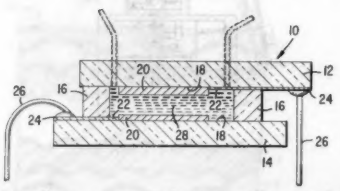
The end coils of border springs of a spring construction are clamped by clamping jaws against a common elongate wire with the end coils overhanging the wire. A bending head attached to a pivotal and reciprocable arm undergoes a sequence of movements to produce bending of the overhanging ends of the coils around the wire.

3,698,449

FABRICATION OF LIQUID CRYSTAL DEVICES

Howard Sorkin, Berkeley Heights, and Richard Ira Klein, Edison, both of N.J., assignors to RCA Corporation

Filed June 23, 1971, Ser. No. 155,897
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—1 **4 Claims**



To provide a uniform composition of the liquid crystal material throughout the device, the interior surfaces of the device are coated or contacted, prior to filling with the liquid crystal material, with certain additive materials normally contained in the liquid crystal material to improve the device performance.

3,698,450

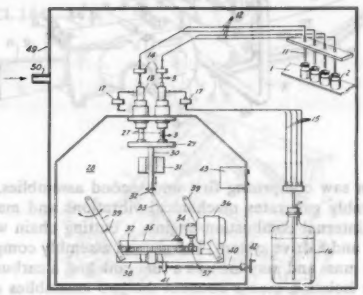
STERILE CONTAINER FILLING MECHANISM

Arthur Sinclair Taylor, Spring Valley; Ellsworth Sandhage, Pearl River, both of N.Y.; George Bott, Westwood, N.J., and William Konazewski, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 812,142, April 1, 1969, abandoned, which is a division of Ser. No. 562,620, July 5, 1966, Pat. No. 3,453,804. This application Oct. 30, 1970, Ser. No. 85,735

Int. Cl. B65b *3/32, 43/42*

U.S. Cl. 141—85 5 Claims



A filling machine for sterile filling of containers such as vials is described in which a moving conveyor brings predetermined amounts of single file, empty, sterile containers under filling nozzles and holds them there until they are filled. The filling machine has a number of nozzles equal to the number of containers, each nozzle having a pumping mechanism in the form of a double-compartment chamber, the two compartments being separated by flexible diaphragms. Pumping means are provided for pumping a predetermined amount of liquid into the second chamber, the amount corresponding to the volume which is to be filled into each container through the nozzle. The diaphragm flexes and in one stroke sucks into the first compartment an amount of liquid from a source which, of course, is the same volume that is pumped out of the second compartment. Then when the pump reverses, this amount is forced into each vial through the filling nozzle. The diaphragm keeps the two liquids separated and maintains sterile conditions. Preferably pumping is effected by a rotating plate connected through a rod and bushing to a plate which moves up and down to effect pumping. The connection is via a rigid rod with a ball and socket joint at each end. The stroke and hence the volume of liquid pumped is varied by lateral displacement of the axis of the horizontal driving plate. Of course check valves are provided in all of the lines so that there can be no back-flow of the liquid being pumped into the containers.

3,698,451

AUTOMATIC BAG OPENING AND FILLING APPARATUS

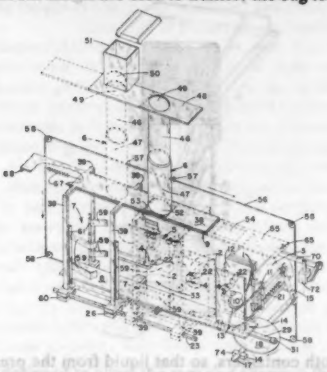
Doyle R. Hudson, West Monroe, La., assignor to Clinkraft, Inc.

Filed Feb. 8, 1971, Ser. No. 113,216

Int. Cl. B65b *43/46*

U.S. Cl. 141—166 5 Claims

An automatic bag opening and filling apparatus comprising: means for removing a bag from a hopper and transferring same to a fill station; means for at least partially opening said bag during the transfer operation; means for holding the bag at the fill station such that the bag is fully open at the top thereof; and means for conveying a filled bag from the fill station to a bag closing device. The apparatus also comprises means for preventing the transfer of product at the fill station when a bag is not removed from the bag hopper. In a preferred embodiment, vacuum means are used to transfer the bag to the fill station and to partially open said bag during the transfer whereas mechanical gripping means are used to hold the bag at the fill station.



3,698,452

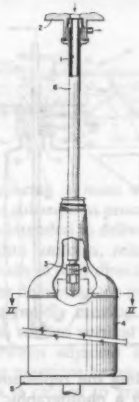
BOTTLE FILLING DEVICE

Chester E. Waxlax, Moon Township, Pa., assignor to Horix Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 12, 1970, Ser. No. 88,577

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—286 7 Claims



Extending down from the lower end of a vertical filling tube is a porous nozzle that is adapted to be inserted in a bottle to be filled. Liquid is discharged from the side of the nozzle in extremely fine streams around it. Preferably, the porous side wall of the nozzle includes a narrow non-porous band extending from top to bottom to create an open vertical path past the liquid issuing from the nozzle for free escape of air from the bottle while it is being filled.

3,698,453

DEVICE FOR STORING TWO LIQUIDS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY UNDER PRESSURE

Bruno Morane, Paris; Charles Paoletti, Aulnay-Sous-Bois, and Yves Hardouin, Survilliers, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 15, 1970, Ser. No. 98,359

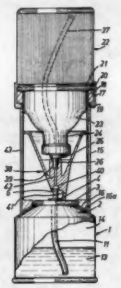
Claims priority, application France, Sept. 1, 1970, 7031762

Int. Cl. B65d *83/14*

U.S. Cl. 141—349 10 Claims

Storage and dispensing device comprises a storage container for holding one liquid under pressure and a dispensing

container in which another liquid is stored. The two containers are connected by a connecting tube along which one of the containers is axially slidable. Such sliding movement opens



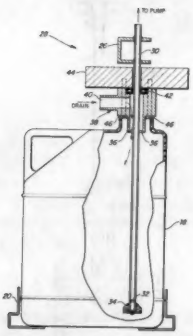
valves on both containers, so that liquid from the pressurized storage container is driven into the dispensing container, which is then separated from the tube and storage container and used as a dispenser.

3,698,454

CONTAINER REPLACEMENT SYSTEM

Harold Cunha, Pittsford, and James A. Kostrzewski, Rochester, both of N.Y., assignors to Itek Corporation, Lexington, Mass.

Filed July 8, 1971, Ser. No. 160,853
Int. Cl. B65b *1/04*; G01f *11/00*
U.S. Cl. 141—375 **11 Claims**



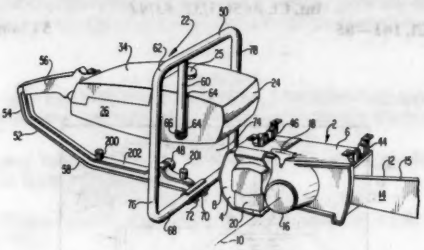
Apparatus for enabling the replacement of containerized processing solutions in a photographic processor in a convenient manner and without leakage of the solutions. When replacement is desired the operator raises vertically slidable door to gain access to processing containers in the processor. Upward movement of the door causes an upward movement of access equipment mechanically coupled to the door, which equipment provides contact with the processing containers and access to the solutions therein. An initial upward movement of the door retracts an access tube, through which the processing solution is pumped, to the top of each container. Each access tube has a conically shaped plug at its end, and further upward movement of each access tube causes the conically shaped plug to seal off an outlet of the access equipment through which the chemical solutions might leak. Still further upward movement of each access tube causes the access equipment to move up to a position completely clear of all the processing containers. At that point the vertically slidable door is completely open. The processing containers are located on a horizontally slidable drawer which is slided out of the machine through the open door. The processing containers are then removed from the drawer and replaced with new containers with fresh processing solutions.

3,698,455

VIBRATION ISOLATION AND BUMPER SYSTEM

Robert Eugene Frederickson, South Gate; John Louis Zimmerer, Torrance, and Jay Richard Bailey, Woodland Hills, all of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed June 26, 1970, Ser. No. 50,163
Int. Cl. B27b *17/02*
U.S. Cl. 143—32 R **14 Claims**



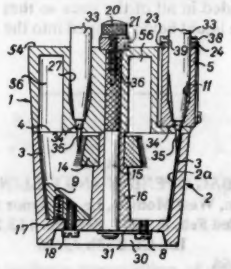
A chain saw comprising first and second assemblies. The first assembly generates mechanical vibrations and may include an internal combustion engine, a cutting chain with a guide bar and a drive system. The second assembly comprises an inertia mass and may include a fuel tank and a carburetor. Vibration isolation means connect the two assemblies and a handle network may be provided to define a cage-like structure connected with the second assembly. The first assembly is resiliently supported within the cage-like network by the vibration isolation means and bumper devices are associated therewith to preclude the failure of the resilient vibration isolation means due to unusual shearing influences being applied thereto. The axis of rotation of a crank shaft within the engine and the cutting plane of the overall saw are arranged to direct a substantial portion of the total vibrational energy along a primary plane of vibration. The vibration isolation means and the bumper devices are generally aligned with, and cooperate to absorb shock energy directed along, this primary plane. The vibration isolation means may be arranged to absorb vibration in shear and the bumper devices may be arranged to absorb energy generally in compression.

3,698,456

LEAD SHARPENER

Antonio Cho, Feldbumenweg 47, Zurich, Switzerland

Filed Oct. 12, 1970, Ser. No. 79,888
Claims priority, application Switzerland, June 18, 1969, 9543/69; Germany, June 18, 1970, P 20 29 929.0
Int. Cl. B43l *23/00*
U.S. Cl. 144—28.11 **12 Claims**



A lead sharpener with oppositely secured, cup-shaped upper and a lower parts which are rotatable relative to each other for grinding a lead retained in a lead holder. A holding member for receiving the lead holder is supported by the

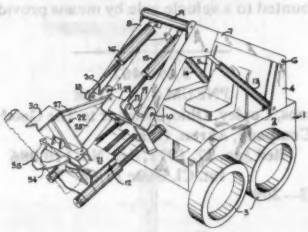
upper part, which holding member is pivotably mounted on the upper part relative to an axis which is parallel to the axis of rotation and further for movement to vary the angle of inclination relative to the axis of rotation, so that a desired angle may be ground on a lead retained in the lead holder.

3,698,457

TREE HARVESTING DEVICE AND METHOD

Joseph E. Blonsky, Atlanta, Ga., assignor to American Pulpwood Association, New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,331
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 R **4 Claims**



A tree harvesting device is mounted on a wheeled vehicle arranged to manipulate the device into desired orientation relative to the vehicle and includes base structure mounted on the vehicle and adapted for manipulation thereon together with a pair of vertically disposed tree engaging elements arranged to engage one side of a tree to be cut. A cutting blade is movably mounted on the base structure and provided with means for operating the blade into cutting engagement with the tree and toward the lower one of the tree engaging elements. Holding means pivotally mounted on the base structure is arranged to engage a part of a tree opposite from the tree engaging elements and to urge the tree into engagement therewith thereby to relieve the blade of at least a part of the weight of the tree and thus to facilitate cutting and to eliminate cutting damage to the severed portions near the cut. Control means is arranged to swing the blade into and out of its operating position, and latch means is provided for aiding in holding the blade in its operating position during a tree cutting operation. The device may be arranged for rotary movement about a longitudinal axis to accommodate changes in terrain.

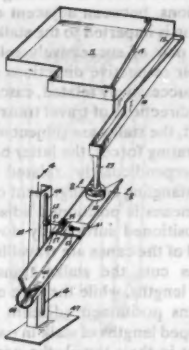
3,698,458

EMBRYO STRIPPER

Wayne E. Hill, Rosemont, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 11, 1971, Ser. No. 114,439
Int. Cl. C12k *7/00, 9/00*
U.S. Cl. 146—2 R **2 Claims**

An embryo stripper utilized in combination with a conventional egg breaker comprising a sloped tray mounted under the egg breaker to receive the embryo containing sacs, a trough having a slope traverse to the slope of the tray in juxtaposition to the tray in order to receive the embryo containing sacs, funnel means extending downward from one end of the trough to conduct the embryo containing sacs to a cutter assembly. The cutter assembly slashes the sacs to liberate the embryos. The embryos are retained on collecting means



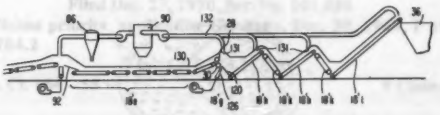
suitably designed to allow the sacs and allantoic fluids to drop into a waste chute below.

3,698,459

METHOD AND APPARATUS FOR PREPARING SUGARCANE STALKS FOR SUBSEQUENT PROCESSING

Sydney E. Tilby, Winterburn, Alberta, Canada, assignor to Canadian Cane Equipment Ltd., Edmonton, Alberta, Canada

Division of Ser. No. 692,237, Dec. 20, 1967, Pat. No. 3,566,944. This application Sept. 2, 1970, Ser. No. 68,982
Int. Cl. B02c *18/00;* A01d *55/00*
U.S. Cl. 146—119 **12 Claims**



A method for preparing a mass of randomly oriented, slender cane stalks for subsequent processing at a selected location. The method is intended to deliver the stalks in cleaned condition, chopped into uniform, relatively shorter lengths and aligned longitudinally in their direction of motion.

The method includes delivering the mass of stalks to a series of successively, more rapidly moving, conveyor means and subjecting the stalks to sudden vertical deflections at some of various junctions between adjacent ones of the conveyor means. At some of the junctions heavy debris (such as rocks) mixed with the stalks is caused to gravitate rearwardly and downwardly between adjacent ones of the conveyor means. At least one junction, leading portions of the stalks in the mass are also subjected to a force in a downstream direction aligned with their direction of travel upstream of the one junction. At another junction concurrently with vertical motion the canes are also subjected to a force in a direction downstream of the other junction, inclined transversely to direction of travel of the canes upstream of the other junction to exert a disentangling effect on the canes. The canes are progressively thinned out and aligned in the direction of travel and, at a point where substantially all the stalks are aligned in the direction of travel, they are chopped into shorter lengths while moving longitudinally.

The chopped lengths are then realigned.

At some point in their travel, the stalks are projected at high velocity across a vertical discontinuity in the conveyor means to cause the stalks to become partially airborne, at which time fluid is directed through the stalks to remove trash.

Apparatus for preparing a mass of randomly oriented, slender cane stalks for subsequent processing which includes a series of separate conveyors successively receiving the stalks.

Some of the conveyors in the series are arranged with their downstream ends spaced vertically above and overlapping the upstream ends of the next succeeding conveyors to define cascading junctions, between adjacent conveyors at which a vertical deflection is imparted to the stalks.

At least one pair of successively related, cascading conveyors have their respective directions of travel aligned and another pair of successively related, cascading conveyors have their respective directions of travel transversely inclined. With this arrangement, the stalks are subjected to simultaneous vertical and accelerating forces, the latter being at separate times in different perpendicularly related directions, thereby facilitating disentangling and alignment of the canes.

A chopping means is positioned adjacent one of the conveyor means positioned sufficiently downstream, at a point where almost all of the canes are travelling longitudinally. The chopping means cuts the stalks transversely thereof into uniform shorter lengths, while they are moving longitudinally. Realigning means positioned adjacent the chopping means realign the chopped lengths of stalk in parallel relation.

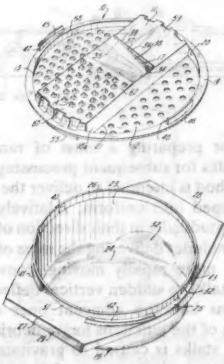
At some point in their travel, the conveyor means project the stalks at sufficiently high velocity across a transversely extending, vertical discontinuity in the series of conveyor means to cause the stalks to become at least partially airborne during which time fluid-directing means directs fluid through the stalks to remove trash.

3,698,460

FOOD GRATER

Harold P. Ashton, Providence, and James B. Swett, Barrington, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 30, 1970, Ser. No. 102,623
Int. Cl. A23n *15/00*
U.S. Cl. 146—180 **6 Claims**



A Food Grater including a unique bowl having at least one handle and at least one flattened planar portion at the side of the bowl. The outermost extent of the handle is in the same plane as the flattened planar portion so the bowl can be held in a tilted position and rested on the outermost extent of the handle and the planar portion without rolling. The bowl is also provided with spaces to accept projections on a mating grater element so that the grater element will not rotate on the bowl when the grater is being used.

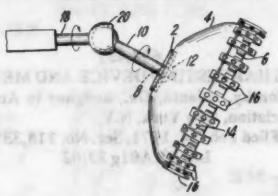
The grater element is divided into separate grating surfaces, some of which are in separate parallel planes. The separation helps prevent the fingers from being scraped on a nearby unused surface. The grater blades on some of the surfaces face in opposite directions from the grater blades on other surfaces so that a portion of the blades can be used when the grater element is in one position and the remainder can be used when the element is inverted. A unique plastic slicer is provided which has a substantially sinusoidal edge which permits the plastic slicer to be used where metal slicers were formerly required.

3,698,461

ELASTIC CONOID SHAPED WHEEL

Edward G. Markow, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, L.I., N.Y.

Filed Dec. 18, 1969, Ser. No. 886,059
Int. Cl. B60b *3/00*, *9/00*
U.S. Cl. 152—5 **7 Claims**



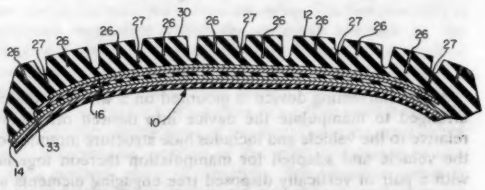
A wheel having a hub connected to a conoidally shaped solid section, the base edge of which is attached to a rim. The wheel is mounted to a vehicle axle by means provided with the hub.

3,698,462

PNEUMATIC TIRE

Paul F. Jacobs, Copley, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1971, Ser. No. 110,086
Int. Cl. B60c *11/06*
U.S. Cl. 152—209 **18 Claims**



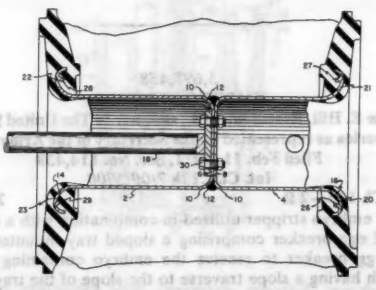
A pneumatic tire having a plurality of circumferentially extending ribs with circumferentially extending grooves separating each pair of ribs. Alternate circumferentially extending grooves extend radially inwardly for only about one-half the depth of the non-skid portion and each has circumferentially extending and circumferentially spaced apart slots in its base which extend for the remainder of the depth of the non-skid portion.

3,698,463

TIRE RIM ASSEMBLY

Neill K. Banks, Jr., and Mark L. Standley, both of Gloucester, Mass., assignors to Bomco, Incorporated, Gloucester, Mass.

Filed Sept. 17, 1969, Ser. No. 858,756
Int. Cl. B60c *5/16*, *7/24*
U.S. Cl. 152—379 **4 Claims**



This invention relates to a one-piece pneumatic tire and wheel assembly wherein two generally cup-shaped members

are welded together back to back to form an airtight rim, and preferably wherein the edge of the rim and the bead of the tire are bonded to each other.

3,698,464

FOLDING DOOR FOR LUGGAGE COMPARTMENT OF VEHICLES SUCH AS MOTOR-COACHES FOR EXAMPLE

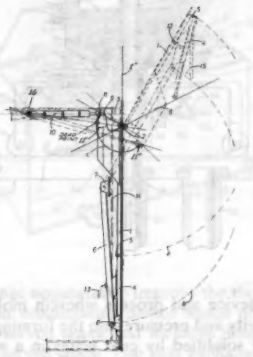
Neal W. Scheitel, Versoix, Switzerland, assignor to Bus & Car Company S.A., Sint.-Michiels-Brugge, Belgium

Filed May 29, 1969, Ser. No. 829,063

Claims priority, application Belgium, Aug. 2, 1968, 61831/68

Int. Cl. E05d *15/26*

U.S. Cl. 160—188 **3 Claims**



A folding door for the luggage compartment of vehicles comprises a pair of leafs pivotally interconnected to one another. The upper leaf is pivotally connected to the wall of the compartment, whereas the lower leaf is pivotally connected to the wall of the compartment. An actuating device is provided which is pivotally connected to the wall of the compartment at one end and also pivotally connected to a projecting arm projecting from the first leaf. The arrangement of pivotal connection of the leafs together with the actuator provides for a dead center position of the projecting arm of the first leaf. When the projecting arm is above the dead center position, the actuator acts on the projecting arm so as to close the leafs against the opening in the compartment. When the projecting arm is below the dead center position, the actuator acts to pull the projecting arm and thereby the first leaf away from the opening in the compartment.

3,698,465

DOOR WITH SECTIONS TELESCOPICALLY DISPLACEABLE INTO EACH OTHER

Martin Birger Aberg, Oslovsgatan 20, Lagan, Sweden

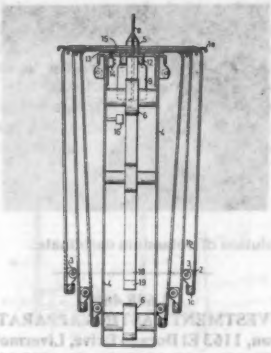
Continuation of Ser. No. 828,280, May 27, 1969, abandoned. This application July 23, 1971, Ser. No. 165,734

Claims priority, application Sweden, Aug. 18, 1968, 7347/68

Int. Cl. E06b *3/44*; E05d *15/16*

U.S. Cl. 160—222 **3 Claims**

A door comprises a number of sections telescoping into each other in the vertical direction. Each section has a base portion and downwardly directed legs which, in the open position of the door, incline inwardly towards each other and, in the closed position of the door, in a substantially parallel position abut the upper portions of the legs of the section underneath. Members such as rollers facilitating the relative movement between the sections are mounted on the lower part of the inside of the legs and are supported at a distance above the lower edge of the sections so that, in the closed position of the door, they are above the base portion of the section underneath. The lowest section is provided with rollers engaging the door frame and an upwardly directed centering pin



which, in the open position of the door, passes through recesses in the base portions of the sections above.

3,698,466

METHOD FOR CONTINUOUS CASTING OF STEEL

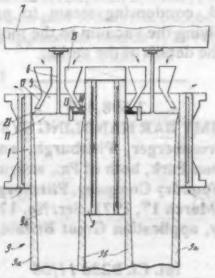
Gerd Vogt, Strump, and Hans-Peter Poeste, Heiligenhaus, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Dec. 23, 1970, Ser. No. 101,056

Claims priority, application Germany, Dec. 30, 1969, P 19 65 784.2

Int. Cl. B22d *27/20*

U.S. Cl. 164—55 **9 Claims**



Differently melting casting powders are used to control imbalance of heat transfer conditions in the cross section of a mold and ingot.

3,698,467

METHOD OF REMOVING SILACEOUS CORES FROM NICKEL AND COBALT SUPERALLOY CASTINGS

Michael H. Fassler, Middletown, and James S. Perron, Deep River, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 4, 1971, Ser. No. 103,544

Int. Cl. B22d *29/00*

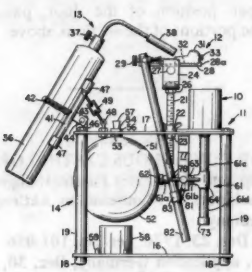
U.S. Cl. 164—132 **3 Claims**

The removal of silaceous ceramic cores from nickel- or

cobalt-based superalloy casting is effectuated by heating the

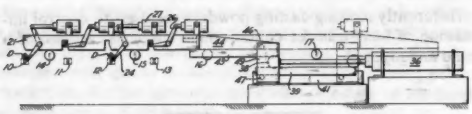
casting in a solution of potassium carbonate.

3,698,468
INVESTMENT CASTING APPARATUS
Billy C. Hudson, 1163 El Dorado Drive, Livermore, Calif.
Filed Nov. 19, 1969, Ser. No. 878,111
Int. Cl. B22d *27/16, 35/06*
U.S. Cl. 164—255 **6 Claims**



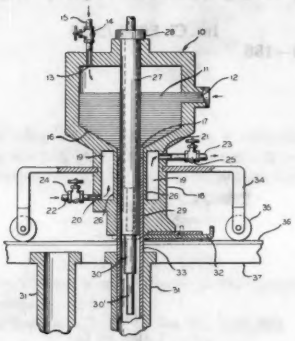
Investment, or lost wax, casting machine including means for forming an investment mold, melting a metal and pouring it into the mold, condensing steam to produce a partial vacuum, and applying the vacuum to the mold to enhance the flow of metal to the details of the mold.

3,698,469
DUMMY BAR HANDLING SYSTEM
Joseph Irwin Greenberger, Pittsburgh, and Joseph James Ciochetto, Allison Park, both of Pa., assignors to United Engineering and Foundry Company, Pittsburgh, Pa.
Filed March 17, 1971, Ser. No. 125,042
Claims priority, application Great Britain, April 23, 1970, 19,571/70
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **6 Claims**



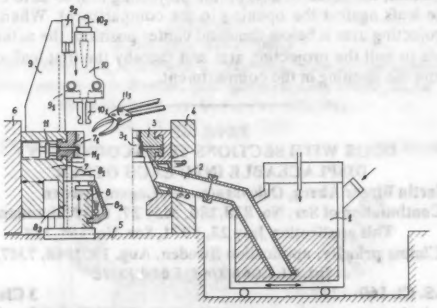
The disclosure of the present invention relates to a dummy bar handling system for use in a single or multistrand continuous casting machine. It includes a traversable support beam on one side of the run-out table and movable to and from a position over the table by a piston cylinder assembly. The beam carries one or more pivotal arms, the lower end of which is designed to carry a dummy bar assembly. The lowering of the arm places the dummy bar on the rollers of the run-out table from where the bar is advanced by the rollers to the pinch rolls of the casting machine. When the bar has served its purpose and is returned to the run-out table, the arm will pick up the bar and carry it to a storage station.

3,698,470
PRESSURE CASTING DEVICE FOR CASTING HOLLOW PRODUCTS
Irving E. Fink, 925 Park Road, El Paso, Tex.
Filed Feb. 26, 1970, Ser. No. 14,276
Int. Cl. B22d *27/14*
U.S. Cl. 164—281 **2 Claims**



A casting device and process wherein molten material is forced by gravity and pressure into the forming mold where it is cooled and solidified by cold water in a surrounding envelope. The casting device may be mounted on wheels to enable successive pourings into adjacent forms.

3,698,471
AUTOMATICALLY OPERATED MULTIPLE CAVITY DIE FOR LOW-PRESSURE CHILL-CASTING
Pierre Chatourel, and Jean Lefebvre, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, France
Filed Sept. 28, 1970, Ser. No. 75,920
Claims priority, application France, Oct. 15, 1969, 6935366
Int. Cl. B22d *33/04*
U.S. Cl. 164—340 **9 Claims**



This device permits the low-pressure chill-casting of parts such as engine pistons in mold cavities formed in pairs of half-dies, said mold cavities being aligned and formed in a fixed half-die receiving the duct supplying the molten metal thereto and in the movable half-die adapted to move by translation away from said fixed half-die by means of retractable members of the type comprising movable core elements, the automatic control units associated with said half-dies being adapted to assemble and disassemble said core elements

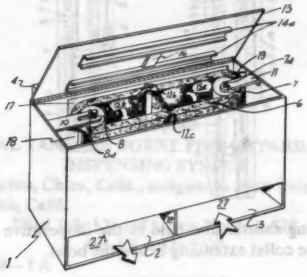
through a sequence of mechanical movements produced by an actuator, automatic means being associated with the device for ejecting and discharging the castings.

3,698,472

THERMAL EFFECT RECLAIM DEVICE

Harold E. Gold, Bettendorf, Iowa, and Ralph B. Smith, Rock Island, Ill., assignors to American Air Filter Company, Inc., Louisville, Ky.

Division of Ser. No. 796,839, Feb. 5, 1969, abandoned. This application May 7, 1970, Ser. No. 47,920
Int. Cl. F23l *15/02*
U.S. Cl. 165—6 1 Claim



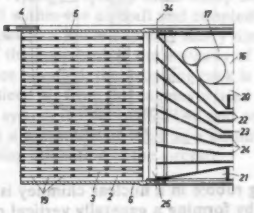
A heat exchange apparatus to improve the thermal efficiency of a room air conditioning device which provides conditioned air to a served space and includes means to provide fresh air to the served space. The heat exchange apparatus is disposed in communicative relation with the air intake of the air conditioning device and with an air outlet from the served space.

3,698,473

ANNULAR RADIATOR

Willi Frank, Egerlander Str. 11, 714 Ludwigsburg, and Gustav Engler, Schillerstrasse, Neckargroningen, both of Germany

Filed Jan. 27, 1969, Ser. No. 794,082
Int. Cl. F24b *1/06*
U.S. Cl. 165—51 4 Claims



An annular radiator having cooling ribs disposed in axial planes between coolant carrying elements which are constructed and arranged in the manner of a diffuser.

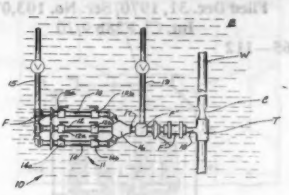
3,698,474

WELL CONDUIT TREATING APPARATUS

Kermit G. Rowley, Houston, Tex., assignor to Tenneco Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 29,091, April 16, 1970, Pat. No. 3,647,000. This application Dec. 14, 1970, Ser. No. 97,940
Int. Cl. E21b *33/03*
U.S. Cl. 166—90 13 Claims

An apparatus which injects successively smaller solid particles into a flowing well conduit where the injected particles are carried to a downstream restriction to form a flow interrupting plug. After the plug is formed, the apparatus injects a heavy fluid into the flow conductor to overcome the formation pressure. The injector apparatus includes a plurality of tubular chambers, each of which contains solid plugging particles of predetermined size. The ends of the chambers are equipped with valving means and a source of high pressure fluid is connected to the inlet end of each chamber. Sequential opening of the valves at the chamber ends permits the high pressure fluid in the inlet end to drive the particles from each of the chambers and inject them into the well flow conduit. After the



plug is formed at the restriction, heavy fluid is pumped through a well control fluid supply line which opens into the well conduit through the injector.

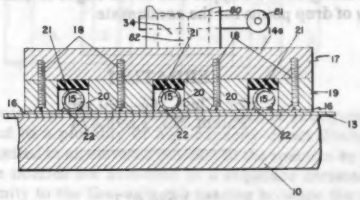
In a modified form, a single tubular chamber contains the graded plugging particles in sequential order according to size. A valving means at the outlet end of the chamber is employed to regulate injection of particles into the well conduit. The inlet end of the chamber is connected to a supply line which provides the fluid drive forcing the plugging materials into the flow conductor and also provides the inlet source for the heavy well treating fluid.

3,698,475

FLAT SHEET OF METAL HAVING AN ELONGATED MEMBER SECURED THERETO

Edward G. Beck, Jr., Ft. Thomas, Ky., assignor to The Stolle Corporation, Sidney, Ohio

Division of Ser. No. 673,138, Oct. 5, 1967, Pat. No. 3,514,834, and a continuation-in-part of Ser. No. 523,619, Jan. 28, 1966, abandoned. This application March 9, 1970, Ser. No. 17,565
Int. Cl. F28f *1/32*
U.S. Cl. 165—171 4 Claims



A method of securing metallic tubing and the like to a flat metal sheet while maintaining the flatness of the sheet so that the composite tube and sheet may be used as radiant heating or cooling panels in building interiors where distortion or wrinkling of the flat sheet would be undesirable. The apparatus comprises a heating station where a composite of sheet, of suitably disposed bonding material, and a piece of tubing in properly assembled relationship and under pressure are heated to induce a bond between the tubing and the sheet while maintaining the sheet in flat condition. An assembly station is provided including a jig in which the piece of tubing may be accurately located, means for accurately locating the jig with respect to the sheet, and means for raising and lowering the jig and for releasing the jig from the raising and lowering means so that it may move with the assembly from the assembly station to the heating station. After the heating cycle, the assembly moves to a cooling station (which may be the

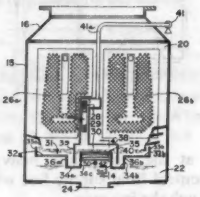
same as the assembly station) for a cooling cycle. A combined assembly and cooling station may be provided on each side of the heating station, each assembly station having a jig whereby production may be speeded up.

3,698,476

COUNTER FLOW-DUAL PRESSURE VENT SECTION DEAERATING SURFACE CONDENSER

Leonard J. Wyzalek, Pompton Plains, and Henry W. Peterson, Millington, both of N.J., assignors to Worthington Corporation, Harrison, N.J.

Filed Dec. 31, 1970, Ser. No. 103,074
Int. Cl. F28b *9/10*
U.S. Cl. 165—112 **9 Claims**



Various forms of surface condensers are disclosed each respectively with a dual pressure deaerating system for condensate using a true counter-flow tray stack section. The tray stack section is disposed within reheating chamber and below a vent condenser chamber through which non-condensible gases are withdrawn from the condenser. Both the reheating chamber and the vent condenser chamber are pressure-isolated by trap means from the associated condenser space. Thus, variations in condenser load are not reflected by pressure changes in the deaerating system and the efficiency of the deaerating system is maintained. Reheating steam introduced into the reheating chamber below the level of the tray stack, flows through the tray stack, counter to the direction of flow of condensate, and to the vent condenser chamber which is maintained at a relatively lower pressure by an ejector. The true counterflow of steam through the tray stack both reheats the condensate and accommodates the separation of non-condensible gases from the condensate. One or more of the tray stack trays is disclosed to be of a construction having serrations along both its upper and lower edges to establish a plurality of drop points for the condensate.

ERRATUM

For Class 166—90 see:
Patent No. 3,698,474

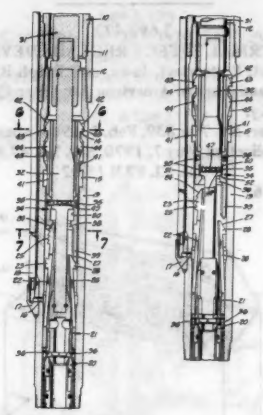
3,698,477

RUNNING-IN TOOL FOR WELLS

Gary A. Radig, Lakewood; Oliva A. Rowell, Jr., Long Beach, both of Calif., and Harvey R. Edwards, Beirut, Lebanon, assignors to Cook Testing Co., Long Beach, Calif.

Filed April 6, 1971, Ser. No. 131,605
Int. Cl. E21b *23/00*
U.S. Cl. 166—214 **8 Claims**

A running-in tool for placing a flow control device in a section of a pipe installed in a well comprises a carrier connected by shear pins to the flow control device and adapted to be lowered into the well pipe, together with a collet encircling a portion of the carrier and connected thereto by additional shear pins. The collet is provided with a series of axially extending spring fingers each having a portion adapted to engage an internal shoulder provided in the well pipe. The flow control device also has axially extending spring fingers for engagement with an internal recess in the well pipe. The collet has an inverted tapered bowl proportioned to receive the upper end of most of the spring fingers of the flow control device to hold them in a retracted inoperative position, the remaining spring



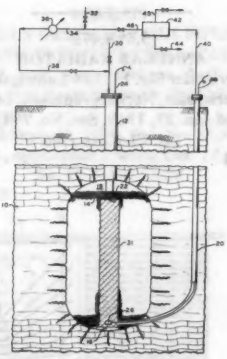
fingers being shorter and held in the inoperative position by posts on the collet extending below the bowl.

3,698,478

RETORTING OF NUCLEAR CHIMNEYS

Harry W. Parker, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 10, 1969, Ser. No. 883,773
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—248 **9 Claims**



Oil-yielding rubble in a nuclear chimney is preconditioned for retorting by forming a generally vertical column of coke-like rubble therein. The mass of rubble in the chimney is then retorted by introducing a hot heating medium. Hydrocarbons educed from the rubble can be recovered in any suitable manner.

3,698,479

SOLUBILIZED OIL-WATER SOLUTIONS SUITABLE FOR MISCIBLE FLOODING

Warren S. Askew, and Richard E. Marrs, both of Tulsa, Okla., assignors to Amoco Production Company

Filed Aug. 8, 1969, Ser. No. 848,500
Int. Cl. E21b *43/16*
U.S. Cl. 166—273 **9 Claims**

Solubilized oil-water solutions suitable for use in miscible flooding and injection well clean-out methods are prepared from an alkali metal petroleum sulfonate containing free

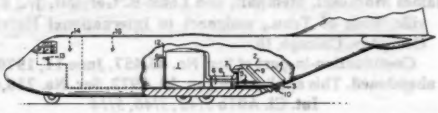
mineral oil and/or crude oil, a cosurfactant or coupling agent such as the ethylene oxide adducts of 4 to 10 carbon atom primary alcohols and a mono-valent ion brine solution having a solids concentration not greater than about 60,000 parts per million. Such solubilized oil-water systems when introduced in the form of a slug into an oil bearing reservoir and displaced through the latter tend to dissolve oil into and reject water from the leading edge of the slug thus creating a gradation of viscosity which increases from the leading edge to the trailing edge of the slug thereby aiding in preventing bypassing of the driving water around the slug during flooding operations. The ratio of sulfonate to cosurfactant employed in these compositions ranges from 1:9 to 7:3.

3,698,480

DUAL TANK AIR BORNE FIRE RETARDANT DISPENSING SYSTEM

Dale P. Newton, Chico, Calif., assignor to Aero Union Corporation, Chico, Calif.

Filed July 12, 1971, Ser. No. 161,528
Int. Cl. A62c *3/00*
U.S. Cl. 169—1 A **10 Claims**



A method and apparatus for airborn fire suppression by means of a portable fire retardant chemical dispensing system, readily adaptable, without extensive aircraft modification, to various makes of aircraft, for dispensing current types of forest and range fire fighting chemicals in a conventional and proven manner. A large capacity main slurry storage tank is centrally located within the aircraft and coupled by means of fluid transfer pipes to a lower capacity slurry dispensing tank positioned aft of the main tank in the doorway of the aircraft's cargo doors. Once emptied, the dropping tank is refilled from the main tank. Bleed air from the engines is used to pressurize the system. The system is readily installed and removed from the aircraft with a minimum of tools in a minimum of manhours for increasing utilization of the aircraft.

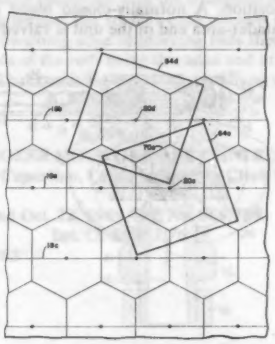
3,698,481

METHOD AND APPARATUS FOR FIGHTING FIRE

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Feb. 18, 1971, Ser. No. 116,536
Int. Cl. A62c *35/00*
U.S. Cl. 169—16 **2 Claims**

A method and apparatus for fighting fire wherein a plurality of extinguishant-discharging heads are supported in an elevated position within the space to be protected and are adapted to discharge the extinguishant in a substantially square pattern over the area to be protected. The heads are arranged in spaced parallel rows with the location of the heads of each row being staggered relative to the location of the heads of its adjacent row, and the diagonal of the square pattern of each head of each row being canted relative to the diagonal of the square pattern of the heads of its adjacent rows.

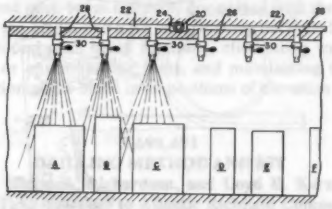


3,698,482

FIRE PROTECTION SYSTEM UTILIZING HIGH-CAPACITY DIRECT DISCHARGE NOZZLES

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Continuation-in-part of Ser. No. 72,333, Sept. 15, 1970, Pat. No. 3,653,444, which is a continuation-in-part of Ser. No. 864,612, Oct. 8, 1969, Pat. No. 3,653,444, which is a continuation-in-part of Ser. No. 885,501, Dec. 16, 1969, abandoned. This application Sept. 29, 1971, Ser. No. 184,684
Int. Cl. A62c *35/00*
U.S. Cl. 169—16 **7 Claims**



A fire protection system wherein a source of extinguishant is connected to a plurality of high-capacity direct discharge nozzles mounted in an elevated position in the space to be protected. The nozzles are activated in a sequence dictated by their proximity to the fire, with the spacing between the nozzles and the configuration of the extinguishant discharge pattern from each nozzle being such that the operation of each nozzle is independent of the operation of the remaining nozzles. Each nozzle has the capacity to discharge the extinguishant at a rate of no less than one-eighth the total capacity of the system.

3,698,483

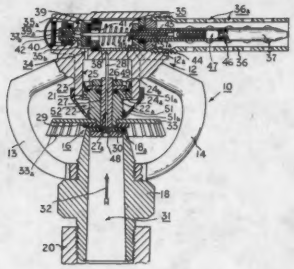
AUTOMATICALLY RESETTABLE FIRE SPRINKLER VALVE

John E. Martin, Winchester, N.H., and Roger B. Landry, Hudson, Mass., assignors to Temptat Corporation, Hinsdale, N.H.

Filed Oct. 27, 1970, Ser. No. 84,319
Int. Cl. A62c *37/08*
U.S. Cl. 169—37 **12 Claims**

An automatically-resettable fire sprinkler valve is normally held closed by a piston-cylinder unit in which both ends of the

piston are exposed to the high main-supply water pressure, one of the piston ends being of greater effective area than the other, such that the same water pressure acting on the different end areas normally forces a valve member to a flow-blocking position. A normally-closed bleed port associated with the broader-area end of the unit is valved open to a pressure-relieving condition by mechanical response of a thermal actuator to temperatures above a predetermined critical level, whereby the sprinkler valve is forced open by the main-supply pressure; when the temperature decreases to a safe low level, the bleed port is automatically closed by the thermal actuator, and equal pressures on the unequal-area piston ends cause positive reclosing of the sprinkler valve.



3,698,484

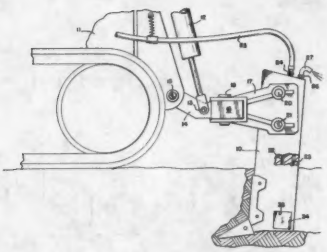
VIBRATORY EARTH ENGAGING SHANK

Frank R. Kinnan, Route 1, P.O. Box 445, Camas Valley, Oreg.

Filed Nov. 25, 1970, Ser. No. 92,724

Int. Cl. A01b *35/00*

U.S. Cl. 172—40 **2 Claims**



An earth engaging shank carried by a tractor for displacement of earthen material upon movement of the shank therethrough. A roller is embodied within the lower portion of the blade remote from the shank attachment to the tractor, to impart vibratory motion to said lower portion of the shank to facilitate passage through the earthen material. Air or hydraulic fluid under pressure powers the roller.

3,698,485

TILLAGE DEVICE

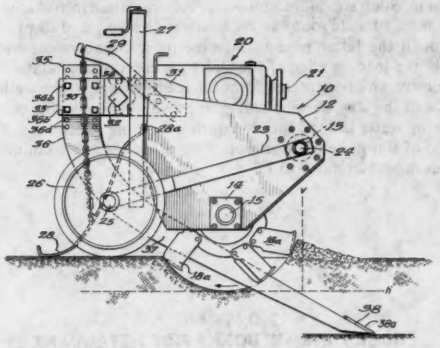
Clarence W. Trimpe, and Roy A. Beldon, both of Seymour, Ind., assignors to Rotary Hoes Ltd.

Continuation of Ser. No. 702,325, Feb. 1, 1968, abandoned. This application Aug. 3, 1970, Ser. No. 60,597

Int. Cl. A01b *49/02, 33/00*

U.S. Cl. 172—65 **14 Claims**

A power driven, rotary soil tillage device in which a driven shaft having spaced rotary tillage members with soil engaging blades is provided with soil erupting chisel point members that extend from a point above and behind the driven shaft, downwardly and forwardly and terminate forward of and below the cylinder of rotation of the blades, so that the blades may work to the depth for forming a seed bed and the chisel point members erupt soil upwardly from below seed bed depth into the rotary tillage members where it is broken into an acceptable tilth. Independent adjustment of the depth of operation of the blades and of the chisel points permits optimum operation under varying soil conditions.



3,698,486

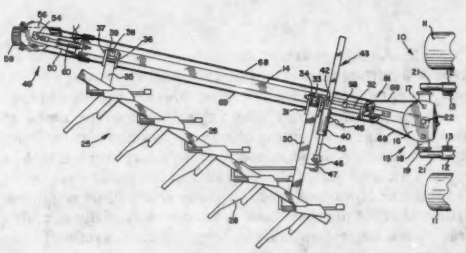
STEERING COMPENSATOR TO ALTERNATELY OFFSET THE TAIL WHEEL ON SEMI-MOUNTED TWO-WAY PLOWS

James Morkoski, Memphis, and Louis B. Garriott, Jr., Knoxville, both of Tenn., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 45,457, June 11, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,405

Int. Cl. A01b *3/42, 3/46, 5/14*

U.S. Cl. 172—212 **8 Claims**



A semi-mounted two-way plow has a supporting frame which in its alternate operating positions is arranged diagonally and has a combination transport and gauge wheel at its rear end which follows a path laterally offset from the center line of the tractor in each of its operating positions, the wheel being steered by means compensating for the offset position of the wheel to constrain the wheel to follow the tractor when turning and to retain its parallel relation to the path of travel in both operating positions.

3,698,487

ROAD MAINTAINER ATTACHMENT

Harold C. Ruth, Caledonia, and James W. Thompson, Ashley, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

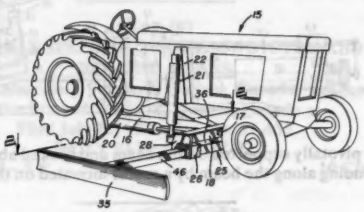
Filed Nov. 12, 1970, Ser. No. 88,689

Int. Cl. A01b *59/046, 65/00, 63/104*

U.S. Cl. 172—305 **4 Claims**

A road maintainer attachment for use on a tractor-type road maintainer and comprising a dozer attachment adapted to operate at the side of the vehicle, for example, in cleaning or smoothing the shoulders of a highway and under guard rails

disposed therealong. The attachment is formed of extensible and retractible sections so that it will have maximum reach when extended and minimum overall length when retracted.

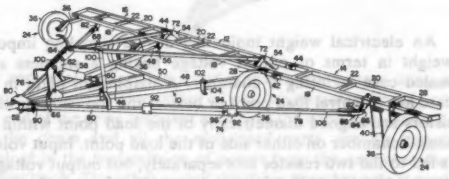


This provides for efficient use of the attachment without increasing the over-all width of the vehicle on which it is mounted.

3,698,488
FIELD CONDITIONER

Alfred Dean Yoder, East Moline, and Robert Richard Roth, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Sept. 3, 1970, Ser. No. 69,365
Int. Cl. A01b *49/00, 63/00*
U.S. Cl. 172—311 **7 Claims**

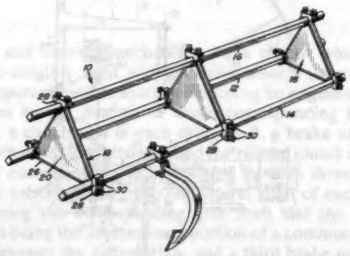


A flexible agricultural implement having a center section pivoted to an elongated draft frame for movement about a transverse axis between alternate lowered working and raised transport positions, a pair of outrigger sections pivotally connected to the ends of the center section for vertical swinging movement when the center section is in the lower working position and forward folding movement when the main frame is in the transport position, and brace means interconnecting each of the outrigger frame sections with the draft frame, each brace means including a pair of pole sections interconnected for limited telescopic movement.

3,698,489
TOOL BAR CONSTRUCTION

Arvin L. Norrell, P.O. Box North Avenue North, and Arvin W. Norrell, P.O. Box 135 925 Avenue Q, both of Sunray, Tex.

Filed Sept. 10, 1969, Ser. No. 856,642
Int. Cl. A01b *23/04*
U.S. Cl. 172—656 **5 Claims**

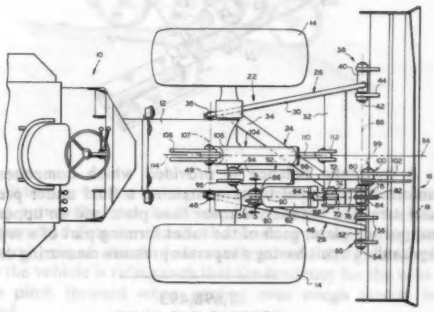


A tool bar unit comprising three parallel tool bars and a series of triangular spacers positioning the bars at approximately equal distances in a triangular pattern whereby two of the tool bars are in the same horizontal plane and act as the mounting tool bars, while the third tool bar is located centrally between the first two tool bars and in a horizontal plane vertically thereabove so as to cooperate with the triangular spacers and define stiffening means. The spacers each consists of a pair of solid plates sandwiching edge reinforcing rods therebetween, the opposed ends of the rods being threaded and orientated so as to define tool bar receiving and clamp mounting members.

3,698,490
BULLDOZER MOUNTING AND CONTROLS

James F. King, Cupertino, Calif., assignor to Clark Equipment Company

Filed Oct. 23, 1969, Ser. No. 868,786
Int. Cl. E02f *3/76*
U.S. Cl. 172—803 **14 Claims**

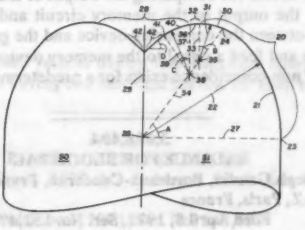


Bulldozer mounting and controls, including a first rigid push beam assembly mounting the blade at laterally spaced points, and a second push beam assembly connected with the blade at the end of the blade, and a tilt jack working between the blade and the second push beam assembly, eliminating warping of the blade or any mounting parts, and maintaining the same tilted position of the blade in all positions of elevation.

3,698,491
DRILLING METHOD AND BIT

Robert N. Hoffman, Richardson, and Loyd R. Kern, Irving, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Feb. 2, 1971, Ser. No. 111,831
Int. Cl. E21b *9/36*
U.S. Cl. 175—329 **7 Claims**



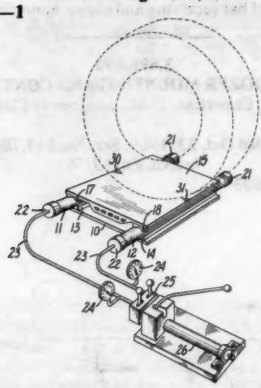
A diamond-type bit of certain cross-sectional configuration and a method for drilling a slim hole wellbore wherein the bit is rotated at a high rate during drilling.

3,698,492

HYDRAULIC BALANCE

Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissement Michelin Raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed May 3, 1971, Ser. No. 139,697
Claims priority, application France, May 15, 1970, 7018017
Int. Cl. G01g 17/00, 5/04
U.S. Cl. 177—1 2 Claims



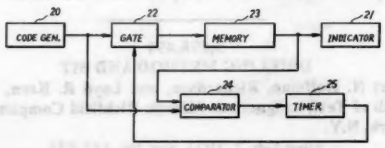
A hydraulic balance is provided which comprises two deformable parallel tubes containing a fluid under pressure and arranged between a lower base plate and an upper load supporting plate, each of the tubes forming part of a separate hydraulic circuit having a separate pressure measuring device.

3,698,493

DIGITAL BALANCE

Masami Yamanaka, Miki, and Takashi Aga, Akashi, both of Japan, assignors to Yamato Scale Company, Limited, Akashi-shi, Japan

Filed Dec. 29, 1971, Ser. No. 213,569
Claims priority, application Japan, June 7, 1971, 46/40021
Int. Cl. G01g 23/38
U.S. Cl. 177—3 2 Claims



A digital balance having a code generator and indicating means for displaying the weight of a commodity and other related information in digital form which includes a gate and a memory circuit between the code generator and indicating means, a device for comparing the output of the code generator with the output of the memory circuit and a timer connected between the comparing device and the gate to operate said gate and feed a signal to the memory device when a condition of non-coincidence exists for a predetermined period of time.

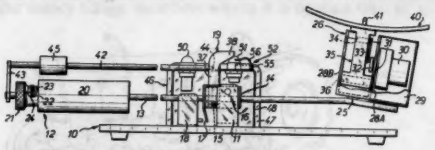
3,698,494

BALANCE FOR BLOOD BAG

Jean Joseph Gaudin, Bordeaux-Cauderan, France, assignor to LABAZ, Paris, France

Filed April 8, 1971, Ser. No. 132,476
Claims priority, application France, April 20, 1970, 7014176
Int. Cl. A61m 1/00; G01g 1/18, 13/30
U.S. Cl. 177—118 11 Claims

A balance for weighing and agitating a blood bag into which blood is fed from a donor, comprises a pivoted beam provided with an adjustable counterweight on one side of the pivot axis and a pan on the other side. The pan is mounted on a rocking



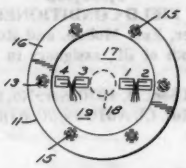
arm pivotally supported on the beam and rocked about an axis extending along the beam by a motor mounted on the beam.

3,698,495

ELECTRICAL WEIGHT INDICATING DEVICE

Norman H. Vogt, 457 Fisher Court, Clawson, Mich.

Filed Sept. 25, 1970, Ser. No. 75,469
Int. Cl. G01g 3/14
U.S. Cl. 177—211 1 Claim



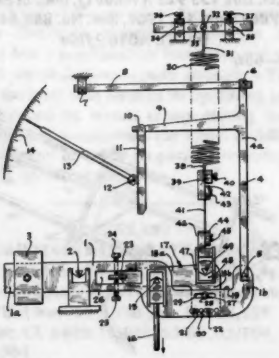
An electrical weight indicating device signaling imposed weight in terms of output voltage having a stainless steel sealed case inclosing a chamber. A diaphragm plate in the case has a central load point or button and the two sets of resistors are aligned diametrically of the load point within the sealed chamber on either side of the load point. Input voltage is fed to the two resistor sets separately, but output voltage is combined on two sides from resistors of each set so that variations in plate or resistor bending are averaged out in the cumulation of the output voltage at the reading device so that output voltage is substantially linearly proportional to imposed weight.

3,698,496

SPRING BALANCE WITH VERTICAL LINEARIZING MEANS

Ernst Lohmann, Duisburg, Germany, assignor to Berkel GmbH, Duisburg, Germany

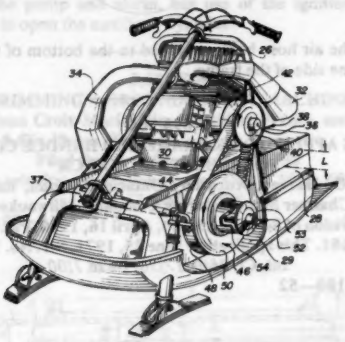
Filed May 20, 1971, Ser. No. 145,324
Claims priority, application Germany, May 29, 1970, P 20 26 309.6
Int. Cl. G01g 1/18, 3/06, 21/00
U.S. Cl. 177—230 12 Claims



A measuring instrument of the spring balance type for measuring a mass, through a measurement of force, which in-

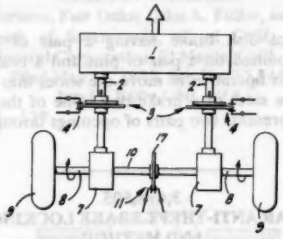
cludes mounting means for a resilient member counteracting the force that maintains the axis of operation of the resilient member linear along the vertical.

3,698,497
VARIABLE SPEED TRANSMISSION SYSTEM AND BRAKING MEANS
Jerome Bombardier, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed July 23, 1970, Ser. No. 57,433
Int. Cl. B62m *9/08, 27/02*
U.S. Cl. 180—5 R **10 Claims**



A snowmobile variable speed transmission system using a sheave drive, the driven pulley of which is mounted directly on one end of the drive sprocket axle; thus the chain case, including the chain and all the associated parts, are no longer required in the transmission of power from the engine to the endless track. The other end of the drive sprocket axle is used to mount the disc of the brake mechanism.

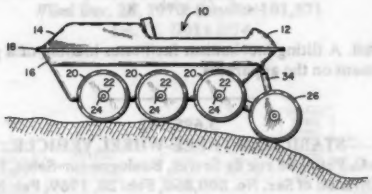
3,698,498
DRIVE AND STEERING MECHANISM FOR TRACTORS
Robert M. Stanford, 2275 Swain Road, Stockton, Calif.
Filed July 12, 1971, Ser. No. 161,753
Int. Cl. B62d *11/10*
U.S. Cl. 180—6.2 **7 Claims**



A drive and steering mechanism, for a tractor which includes non-dirigible right and left drive wheels (or endless tracks) supported by axle shafts, comprising an engine-driven transmission having dual drive shafts corresponding to the axle shafts, a clutch unit in each drive shaft, a brake unit associated with each drive shaft beyond the related clutch unit, a differential corresponding to and driven by each drive shaft beyond the related brake unit, one lateral shaft of each differential being the corresponding axle shaft and the other lateral shaft being the adjacent end portion of a common shaft spanning between the differentials, and a third brake unit associated with such common shaft.

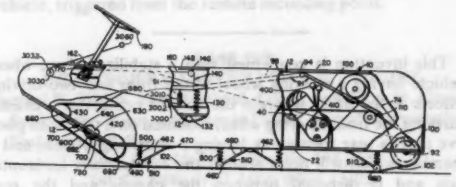
With the first-named brake units released, and the clutch units and said third brake unit engaged, the tractor is driven straight ahead, but—with selective and independent manipulation of said clutch units and brake units—the tractor can be caused to turn to right or left with a mild, sharp, or very abrupt steering action as operating conditions may dictate, and all under the effective control of the driver of the tractor.

3,698,499
ALL TERRAIN VEHICLE STABILIZING WHEELS
Robert V. Albertson, 2100 Shady Wood Road, Minneapolis, Minn.
Filed May 13, 1970, Ser. No. 36,775
Int. Cl. B62d *61/10*
U.S. Cl. 180—6.2 **2 Claims**



An all terrain vehicle having an additional pair of wheels extending outwardly from the front or the back of the vehicle a predetermined distance and shock absorbing means urging the additional pair of wheels downwardly toward the ground on which the vehicle is riding such that the tendency for the vehicle to pitch forward when passing over rough terrain is reduced.

3,698,500
TWO-TRACK VEHICLE
Albert T. Jernigan, Payson Route P.O. Box 210, Globe, Ariz.
Continuation-in-part of Ser. No. 780,402, Dec. 2, 1968, abandoned. This application May 19, 1969, Ser. No. 840,579
Int. Cl. B62d *11/08*
U.S. Cl. 180—6.7 **2 Claims**

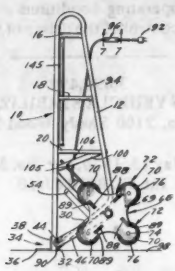


An off-the-road vehicle having two tracks for operating on soft terrain and having two belt clutches one for each track.

3,698,501
POWER-OPERATED DOLLY
Eshcol Silas Gross, 3320 1/2 Delmarr, South San Gabriel, Calif.
Filed June 1, 1971, Ser. No. 148,639
Int. Cl. B62d *5/02*
U.S. Cl. 180—8 A **9 Claims**

An apparatus for electrically, as well as manually, moving heavy objects up stairways. A group of wheels at each side of a dolly frame are arranged about a common axis, each group being operable about the axis of an electric drive and each

wheel of each group being rotatable about its own axis, but capable of being locked against forward rotation when



required. A tilting mechanism facilitates loading of a piece of equipment on the apparatus.

3,698,502

STABILIZED THREE-WHEEL VEHICLE

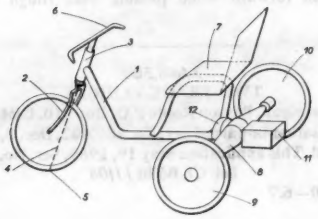
Pierre C. Patin, 58 rue de Sevres, Boulogne-sur-Seine, France

Division of Ser. No. 800,860, Feb. 20, 1969, Pat. No. 3,601,213. This application Aug. 7, 1970, Ser. No. 62,078

Claims priority, application France, Feb. 22, 1968, 68140891; Feb. 7, 1969, 6902980

Int. Cl. B62d *61/08*

U.S. Cl. 180—27 **9 Claims**



This invention is concerned with a stabilized three-wheel vehicle having a steering wheel at the front and two driving wheels at the back, wherein the vehicle comprises a chassis carrying the front steering wheel mounted on a fork with positive play, a rear framework having two driving wheels, and a member which will pivot around the substantially horizontal axis and is disposed between the chassis and the rear framework, a device sensitive to resultant of weight and centrifugal force being provited to enable the pivotal member to be locked.

3,698,503

SUPPORT OF AN AIR HOSE OF AN AIR CLEANER OF A MOTORCYCLE AT ITS INLET OPENING

Mikihiro Koyama, Adachi-machi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

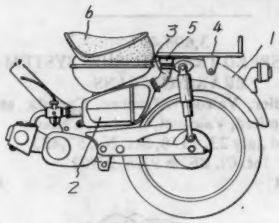
Filed Nov. 30, 1970, Ser. No. 93,643

Claims priority, application Japan, Dec. 10, 1969, 44/116773

Int. Cl. B62d *3/00*

U.S. Cl. 180—33 R **6 Claims**

An air inlet opening of the hose of an air cleaner in a motorcycle faces upwardly and is fixedly located below the front portion of a carrier. The carrier is made larger in width than the vehicle frame, and a housing is attached in offset manner to the lower surface of the carrier and is provided with an opening in its rear surface position just above the vehicle



frame, the air hose being attached to the bottom of the housing on one side of the frame.

3,698,504

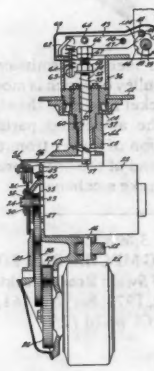
SPRING APPLIED DISK BRAKE AND HANDLE CONTROL FOR INDUSTRIAL TRUCK

Dennis G. Harvey, Ancaster, Ontario, Canada, assignor to Allis-Chalmer Manufacturing Company, Milwaukee, Wis.

Division of Ser. No. 29,140, April 16, 1970, Pat. No. 3,659,681. This application June 25, 1971, Ser. No. 156,790

Int. Cl. B60k *17/30*; B62d *7/00*

U.S. Cl. 180—52 **7 Claims**



A compact disk brake having a pair of brake shoes floatingly mounted on a pair of pins and a brake operating lever which is operative to move the shoes into engagement with opposite sides of a brake disk. One of the shoes is U-shaped and presents two pairs of openings through which the pins extend.

3,698,505

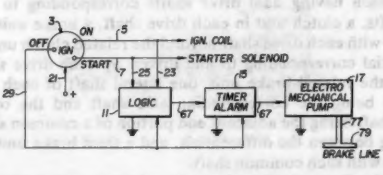
VEHICULAR ANTI-THEFT BRAKE LOCKING DEVICE AND METHOD

Houston F. Webley, 102 Park Avenue, Herndon, Va.

Filed May 17, 1971, Ser. No. 143,763

Int. Cl. H02g *3/00*

U.S. Cl. 180—114 **11 Claims**



The invention applies to vehicular brakes for a predetermined time period whenever the vehicular coil or starting

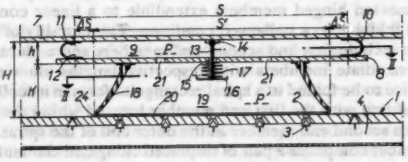
motor circuitry is energized with the ignition in the OFF position. A logic circuit is readied when the vehicle ignition is turned to the OFF position and/or the key removed. Subsequently, if the wires are crossed or a jumper used to excite the coil, starting solenoid or motor, the logic system senses this tampering and energizes an electro-mechanical pump to actuate a piston in an auxilliary cylinder connected to the vehicular brake system to apply and lock the brakes on under control of a timer. An alarm controlled by the timer may be sounded at any selected moment during the lock-up time. The circuitry is automatically reset at the expiration of the predetermined time to again sense his tampering and lock up the brakes if detected. Access is provided to the timer alarm to release the pump and alarm, but use of the ignition key is required to open the auxilliary cylinder.

3,698,506

TRIMMING A GROUND-EFFECT MACHINE

Francis Jean Croix-Marie, Viry Chatillon, France, assignor to Bertin & Cie, Plaisir, France

Filed Oct. 2, 1970, Ser. No. 77,598
Claims priority, application France, Oct. 2, 1969, 6933700
Int. Cl. B61b *13/08*
U.S. Cl. 180—118 **6 Claims**



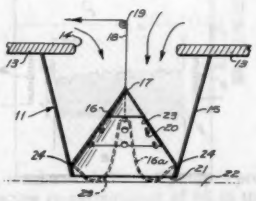
Trimming of an air cushion vehicle is obtained by properly delaying the compensation effect derived from a bracing actuator extending between the vehicle frame and a bearing plate movable relatively to the latter to compensate for possible variations in the distance between this bearing plate and the surface along which the vehicle moves.

3,698,507

DIRECTION AND BRAKING CONTROL FOR FLUID CUSHION VEHICLES

Albert P. Meriano, Fair Oaks; Giles A. Fuller, and William H. Knuth, both of Sacramento, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed May 15, 1970, Ser. No. 37,544
Int. Cl. B60v *1/00, 1/14*
U.S. Cl. 180—119 **4 Claims**



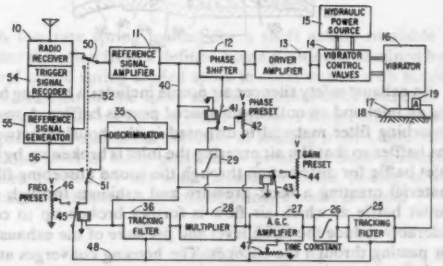
A fluid cushion vehicle of the type provided with a number of cushion cells beneath it which by the force of fluid such as compressed air sent through them, cause the vehicle to hover above the terrain, water, ice or similar supporting medium, has one or more of its cushion cells arranged as a control cell, and provided with a flexible diaphragm within the cell in the general shape of a cone when distended. The bottom rim of the diaphragm is fixed within the cushion cell near the lower rim of the cell and the upper part or apex of the diaphragm can be held distended upwardly by a cable attachment. Fluid under pressure, such as compressed air, is sent into the cell above the diaphragm and is allowed to pass through holes in the diaphragm and out the bottom of the cell, thereby putting fluid pressure above the diaphragm. The control cell can be used for braking or steering by releasing the cable to lower the diaphragm sufficiently to drag along the terrain, or other supporting surface.

3,698,508

PHASE CONTROL OF SERVO HYDRAULIC VIBRATORS

Ralph A. Landrum, Jr., Tulsa, Okla., assignor to Amoco Production Company

Filed Dec. 28, 1970, Ser. No. 101,571
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 H **4 Claims**



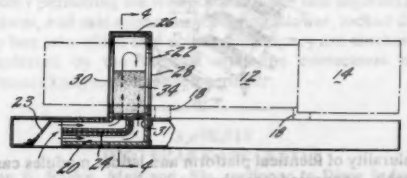
In seismic geophysical surveying using a servo-controlled vibrator as the energy source for transmitting a predetermined varying-frequency seismic wave train into the earth, ground-coupling distortion and vibrator inefficiency at low frequencies cause loss of phase lock so that the vibrator no longer follows the reference or pilot signal. This problem is solved by interposing a filter with a varying frequency cutoff that passes the varying reference frequency in the feedback from the vibrator base plate, but rejects the distorting harmonic frequencies. The reference signal can be transmitted from a remote recording point, but preferably it is generated from a stored program or from frequency-change data at the vibrator vehicle, triggered from the remote recording point.

3,698,509

INLET NOISE SILENCER FOR A JET ENGINE

Samuel E. Fitting, East Hartland, Conn., and Gary W. Green, Springfield, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 24, 1971, Ser. No. 156,255
Int. Cl. F01n *1/10, 1/14*; B64d *33/02*
U.S. Cl. 181—33 HA **3 Claims**



The noise silencer consists of an annular chamber being in communication with the inlet of the gas turbine engine and a substantially U-shaped baffle member disposed between the inlet of the silencer and the inlet of the engine wherein the legs of the U are spaced substantially parallel to the side walls of the cavity to define flow channels with L/D ratios (length to

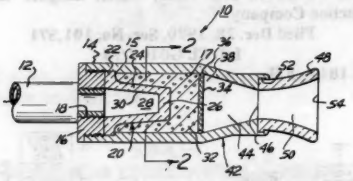
diameter or the smallest planar cross-sectional dimension when the cross section is other than circular) being greater than ⅛, which channels serve to guide the air and sound waves over a resistive acoustical lining and provide a lined bend around which the air and sound waves must pass.

3,698,510

SAFETY SILENCER AIR NOZZLE

Leland Francis Blatt, and Frank Henry Wiesenhofer, both of 31915 Groesbeck Highway, Fraser, Mich.

Filed Aug. 4, 1971, Ser. No. 168,861
Int. Cl. F01n *1/10, 1/24, 7/20*
U.S. Cl. 181—36 A **1 Claim**



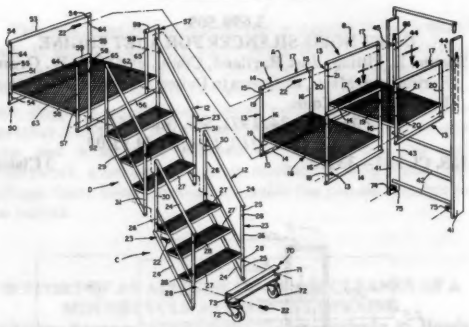
An exhaust safety silencer air nozzle includes a housing having an inlet and an outlet with spaced porous baffles. A sound absorbing filter material is disposed in the housing between the baffles so that the air entering the inlet is broken up by the inlet baffle for distribution through the sound absorbing filter material creating a back pressure and exhausts through the outlet baffle at which air flow is further broken up to considerably reduce the noise level and pressure of the exhausted air passing through the silencer. The housing converges at its outlet and terminates in a throated outwardly flared bell to further reduce the exhaust air pressure for cleaning or blowing off a part.

3,698,511

MODULAR FIXED-LEVEL WORK PLATFORM

William L. Dohan, Downingtown, Pa., assignor to Ballymore Company, West Chester, Pa.

Filed Oct. 6, 1970, Ser. No. 78,441
Int. Cl. E04g *1/14*
U.S. Cl. 182—113 **9 Claims**



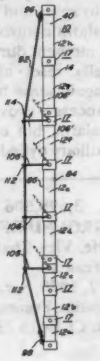
A plurality of identical platform and ladder modules can be releasably connected together in various combinations to achieve a unitary rigid structure that establishes a fixed level work platform of the desired configuration supported by steps providing access thereto. The construction of the modules permits them to be manufactured at one location, and individually shipped to a remote location where they can be assembled in-situ into the desired configuration.

3,698,512

COLLAPSIBLE LADDER DEVICE

John V. Cebular, 2126 Shallcross Street, Philadelphia, Pa.

Filed April 27, 1971, Ser. No. 137,852
Int. Cl. E06c *1/52, 7/10*
U.S. Cl. 182—164 **6 Claims**



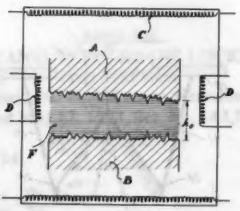
A collapsible ladder device comprising a plurality of series connected hinged members extendible to a linear condition and foldable to a collapsed condition. The plurality of members include first and second end members and a plurality of intermediate members with respective lengths allowing the device to be folded to a spiral rectangular form in its collapsed condition with the first end member located within the spiral and a second end member at the outer end of the spiral. Each member comprises a pair of displaced elongated elements substantially parallel to each other providing first and second sides of the device and a plurality of rung means connected between and securing together the first and second sides providing the steps for the device. Securing means comprising elongated flexible bands with first and second ends secured respectively with the first and second members when the device in its extended condition extends along the rear side of the elements for maintaining the device in its linear condition.

3,698,513

PROCESS FOR THE LUBRICATION OF MECHANICAL SYSTEMS SUBJECTED TO VERY HIGH CONTACT PRESSURE

Luis Arizmendi Espunes, Madrid, Spain, assignor to Instituto De Quimica Fisico Rocasolano, Madrid, Spain

Filed Sept. 24, 1970, Ser. No. 74,978
Int. Cl. F01m *15/00*
U.S. Cl. 184—5 **2 Claims**



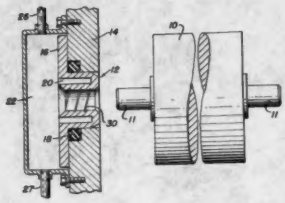
A process for utilizing molten glass as a lubricant in mechanical systems that have to meet demanding and specific load conditions. A film of lubricating glass is provided between mating surfaces, and this glass is heated to maintain it in a molten state. The contact pressure between the mating surfaces is determined, and the temperature of the glass is controlled as a function of the contact pressure in order to control the viscosity of the molten glass so that hydrodynamic

lubrication can be obtained under the conditions of contact pressure to which the mating surfaces are subjected.

3,698,514
COOLING AND LUBRICATION FOR HIGH SPEED ROTATING SYSTEMS

Willard E. Buck, Los Gatos; Robert J. Herbold, Sunnyvale, and Randy J. Sherman, San Jose, all of Calif., assignors to Technical Operations Incorporated, Burlington, Mass.

Continuation of Ser. No. 668,375, Sept. 18, 1967, abandoned. This application Aug. 28, 1969, Ser. No. 854,029
Int. Cl. F01m *1/18*
U.S. Cl. 184—6.4 **4 Claims**

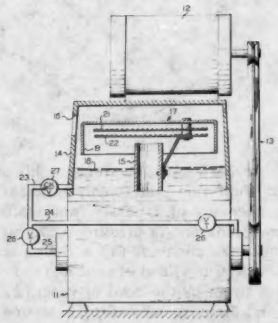


A high speed rotating system driven by a motor which constitutes a source of heat. The system has bearings of porous material through which a liquid coolant is fed and in which heat of friction causes vaporization of the lubricant and hence cooling of the bearing and dissipation of heat from the motor due to the fact that the latent heat of vaporization is derived from the bearing surface and immediately adjacent areas.

3,698,515
VACUUM PUMP LUBRICATION SYSTEM

Zbigniew C. Dobrowolski, Needham, Mass., assignor to General Signal Corporation

Filed Dec. 21, 1970, Ser. No. 100,260
Int. Cl. F16n *39/00*
U.S. Cl. 184—6.23 **1 Claim**

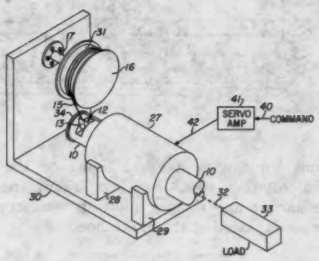


An oil-sealed, mechanical vacuum pump is provided with a scheme for reducing re-entrainment of oil in the gas stream passing through the oil separator of the pump. The scheme comprises check valve means located in the gravity feed lubrication circuit leading from the separator to the pump bearings and which serves to prevent reverse flow of gas into the separator during operation of the pump at high inlet pressures. This measure prevents agitation of the stored oil in the separator, and consequently reduces the risk of re-entrainment resulting from splashing.

3,698,516
CENTERING DEVICE

Winston F. Williams, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed July 14, 1971, Ser. No. 162,466
Int. Cl. F02g *1/02*
U.S. Cl. 185—39 **8 Claims**

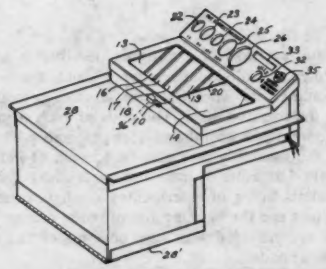


A low rate spring loading for a shaft axially rotatable in either direction from a defined home position is obtained by a spiral coiled spring loaded spool in combination with tension cable carried on the spool and circumferentially anchored to the shaft. Shaft rotation in either direction from home position imparts a proportional increase in loading from a selectable preload level at home position. A pivotable cable anchoring means carried by the shaft minimizes cable flexing at the anchor point as the shaft rotates through home position.

3,698,517
PURCHASE PAYMENT COLLECTION APPARATUS

Earl J. Kuehl, and La May R. Kuehl, both of 11127 West Bluemound Road, Milwaukee, Wis.

Filed Feb. 19, 1971, Ser. No. 117,011
Int. Cl. E04h *3/04*
U.S. Cl. 186—1 A **3 Claims**



A transparent money receptacle mounted in the counter of a restaurant or diner or the like designed to receive a patron's payment, said receptacle including individual compartments for paper money and coins of different denominations, thereby permitting the ready tabulation of said payment by the waitress, and said apparatus including a lower, locked depository box into which said coins and currency are mechanically transferred by the waitress after the correctness of the customer's payment has been verified.

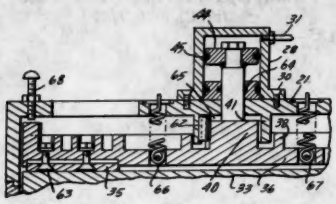
3,698,518
DISC BRAKE APPARATUS

Elmo N. Boyles, Maitland, Fla., assignor to Disco Industries, Inc.

Filed Jan. 14, 1971, Ser. No. 106,365
Int. Cl. F16d *55/228*
U.S. Cl. 188—72.5 **7 Claims**

A vehicle brake apparatus for attachment to the axle of a vehicle having a rotatable disc attached so as to rotate with the

wheel of a vehicle and having flanges carried by a housing attached to the axle of the vehicle so that a brakeshoe carried by brakeshoe carrier telescopes in the flanges attached to the



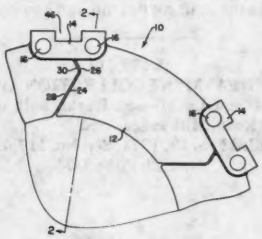
axle housing for driving a brake lining on the brakeshoe against he rotating disc. Bearings riding between the brakeshoe carrier and flanges allow the telescoping action when a torque is placed on the brakeshoe.

3,698,519

ARTICULATED DISC BRAKE CONFIGURATIONS

Richard L. Crossman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 23, 1970, Ser. No. 101,033
Int. Cl. F16d *65/12*
U.S. Cl. 188—73.2 **15 Claims**



The rotating disks of a multiple disk brake assembly are each formed of individual segments which are held together by clips and rivets. The clips also serve to provide the drive slots for the rotating disks. The ends of each segment are V-shaped to interlock with the adjacent segments. The stationary disks of the assembly may also be formed of individual segments joined together by links and rivets with adjacent ends of the segments being of interlocking configurations. The stationary disks and the backing and pressure plates of the brake assembly are provided with steel core plates and replaceable friction wear pads.

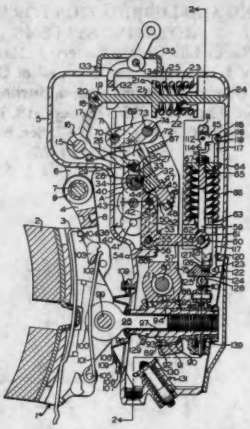
3,698,520

TREAD BRAKE APPARATUS

Glenn T. McClure, McKeesport, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 24, 1971, Ser. No. 156,394
Int. Cl. B60t *13/04*
U.S. Cl. 188—171 **11 Claims**

This invention relates to a spring-applied power-released brake assembly for each individual wheel of a railway car truck, wherein the brake assembly comprises an electrical torque motor that is effective when fully energized to cause a brake release by moving the fulcrum for a proportioning or variable ratio lever relative to this lever against the yielding resistance of a comparatively light control spring to a position in which a comparatively heavy brake-applying spring becomes effective to bias this lever in the brake-release direction. As the current supplied to the torque motor is reduced, the control spring is rendered effective to shift the fulcrum relative to the lever to a position in which the brake-applying spring is effective via one arm of the variable ratio lever to bias this lever in a brake-applying direction and thereafter, in response to a further reduction of current, to increase the length of this one



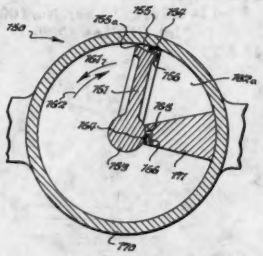
arm to thereby render the brake-applying spring effective via this lever to correspondingly increase the braking force on the wheel.

3,698,521

FLUID AMPLIFIED LIQUID SPRING SHOCKS AND/OR SHOCK ABSORBERS

Paul H. Taylor, 3877 East River Road, Grand Island, N.Y.

Division of Ser. No. 764,377, Sept. 30, 1968, abandoned. This application Oct. 30, 1970, Ser. No. 85,795
Int. Cl. F16d *57/02*
U.S. Cl. 188—306 **6 Claims**



A shock absorber which uses fluid amplification to provide programmed fluid flow and highly efficient shock curves without the necessity of expensive and inefficient metering holes, metering pins, and/or pressure responsive valves is provided by the interaction of: (1) a fluid passage clearance between a shock piston head or vane and the chamber, which houses and is swept by the head or vane, (2) an indentation formed around the periphery of the head or vane, and (3) a plurality of openings between the head or vane and the indentation formed around the periphery of the head or vane.

3,698,522

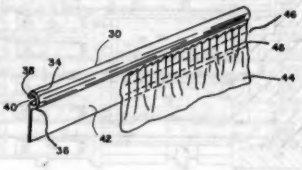
LUGGAGE CASE

Arnold Aronoff, Montreal, Quebec, Canada, assignor to Holiday Luggage Mfg. Co., Inc., Montreal, Quebec, Canada

Filed June 18, 1970, Ser. No. 47,335
Int. Cl. A45c *3/00*
U.S. Cl. 190—41 R **9 Claims**

An apparatus and method of manufacture of luggage cases, improving the concealment of the interior lines of joinder by

the use of one-piece masking assemblies. The luggage cases are constructed of shell members joined to frame member forming the body of the case whereby the line of joinder is evident at the point where the shell and frame members join. The masking assembly has a resilient deformable body portion provided with a first mating member, such as a channel in the



body for engaging a second mating member, which may include a continuous or intermittent projection attached to the shell or frame. The masking assembly has a depending skirt so that when the body of the masking assembly is connected to the cooperating mating member of the luggage case the depending skirt conceals the line of joinder.

3,698,523

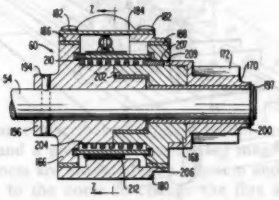
SELF-PROPELLED RANDOM MOTION LAWNMOWER

S. Lawrence Bellinger, Florissant, Mo., assignor to Mowbot, Inc., Tonawanda, N.Y.

Division of Ser. No. 791,566, Jan. 16, 1969, Pat. No. 3,570,227, which is a continuation-in-part of Ser. No. 405,064, Oct. 20, 1964, Pat. No. 3,550,714. This application Oct. 20, 1969, Ser. No. 870,714

Int. Cl. F16d *67/02*

U.S. Cl. 192—12 BA **4 Claims**



Disclosed is a self-propelled lawnmower for cutting grass in a completely random and unattended manner. The unit is preferably propelled by a battery and comprises a frame supported on a pair of front caster wheels and a pair of rear drive wheels. The drive wheels are coupled to a continuously rotating drive shaft by individual clutch-brake mechanisms. When a boundary wire is sensed by coils on the frame, the drive wheel furthest away from the broader is unclutched and braked to pivot or turn the mower. No backup motor or complex steering control is required. A pair of adjustable rotary cutter blade assemblies are carried on the frame.

3,698,524

I.P.T.O BRAKE UNIT

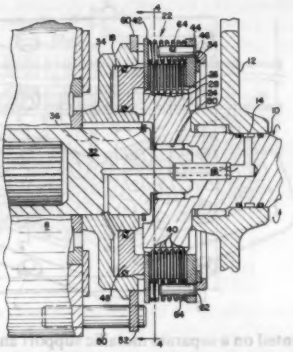
William L. Schubert, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 19, 1971, Ser. No. 116,988

Int. Cl. F16d *67/04, 71/00*

U.S. Cl. 192—18 A **5 Claims**

A braking mechanism for an independent power take-off unit that prevents the independent power take-off shaft from rotating through an arc of more than 360° when the clutch is



disengaged, but permits free rotation of the independent power take-off shaft through an arc of less than 360°.

3,698,525

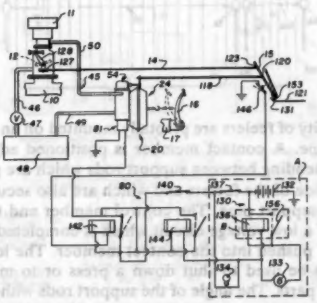
CLUTCH AND THROTTLE CONTROL

August W. T. Grassmuck, 3870-216th Street, R.R. #1, Langley, British Columbia, Canada

Filed April 12, 1971, Ser. No. 132,969

Int. Cl. B60k *21/00*

U.S. Cl. 192—.075 **3 Claims**



A mechanism attachable to a vehicle to convert a friction clutch, which normally is manually operated, to one which will operate automatically at the discretion of the driver. The mechanism includes a clutch operating unit powered by a difference in pressure developed by the engine and a dual control valve for the unit which is actuated simultaneously with the gas pedal to progressively engage and disengage the clutch as the gas pedal is depressed and released to vary the speed of the engine.

3,698,526

FRICTION LINING FOR BRAKES, CLUTCHES AND LIKE APPARATUS

Wilhelm Berges, Hauptstrasse 135 B, Marienheide/Rheinland, Germany

Filed Jan. 5, 1970, Ser. No. 611

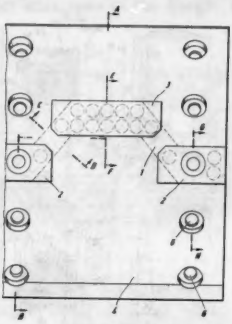
Claims priority, application Germany, Jan. 7, 1969, P 19 00 459.2

Int. Cl. F16l *13/60*

U.S. Cl. 192—107 M **5 Claims**

Friction lining for brakes and clutches, comprising organically bonded friction material and sintered and metallically bonded friction material members or particles, embedded in

the aforementioned friction material and mounted on a metallic friction lining support, the sintered member or members



are mounted on a separate metallic support and the support or supports are mounted directly on the friction lining support.

3,698,527

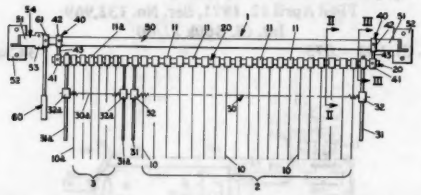
PRESS GUARD AND PARTS MONITOR

Nicholas W. Wiggers, 745 Lincoln, Apt. 5, Holland, Mich.

Filed Jan. 15, 1971, Ser. No. 106,679

Int. Cl. H01h *3/16*; F16p *7/00*

U.S. Cl. 192—129 A **20 Claims**



A plurality of feelers are pivotally mounted on an elongated support pipe. A contact member is positioned adjacent the feelers, extending between support rods which are positioned on either side of the feelers and which are also secured to the elongated support pipe. The control member and the feelers are part of a low voltage circuit which is completed when the feelers are pushed into the contact member. The low voltage circuit can be used to shut down a press or to monitor the passage of parts. The angle of the support rods with respect to the vertical can be varied to thereby vary the distance between the contact member and the feelers. The elongated support pipe is itself secured to a main support pipe by yokes which can be adjusted to allow one to move the feelers either closer to or farther from the press. A handle is secured to the main support rod to allow one to pivot the contact member into the feelers and then lift them up and out of the way completely.

In an alternative embodiment, the feelers are fixed at one end to the elongated support pipe, but have spring sections which allow them to be pivoted. The contact member comprises a bracket having apertures therein through which the feelers extend. Movement of the feelers causes them to engage the contact member through which they extend and thereby shut down the press or monitor parts.

3,698,528

COMPACT PRINT HEAD ASSEMBLY WITH ANTIREBOUNDING MEANS

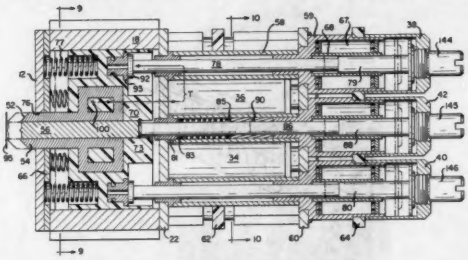
Peter H. De Graff, Newfield, N.Y., assignor to The National Cash Register Company, Dayton, Ohio

Filed April 3, 1970, Ser. No. 25,358

Int. Cl. B41j *7/70*

U.S. Cl. 197—1 **5 Claims**

A printing bar arrangement for high-speed operation wherein the bars are slidably nested and supported in relation to one another and include tip portions capable of printing alpha-numeric characters upon precise striking of one or more of the separate bars. The printing bars are fixedly connected to blocks, also slidably nested, which blocks are positioned to



be driven by appropriate solenoid mechanism wherein the coupling forces derived from an offset drive line are absorbed within the blocks to provide an even and parallel operation of the printing bars.

3,698,529

SERIAL PRINTER WITH FIXED INTERPOSER

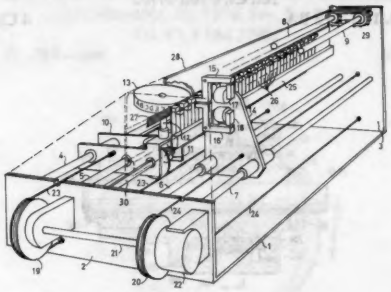
Sergio Cattaneo, Pavia, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed July 12, 1971, Ser. No. 161,581

Claims priority, application Italy, July 14, 1970, 27391 A/70

Int. Cl. B41j *1/26*

U.S. Cl. 197—49 **11 Claims**



A serial printer is provided having a movable type-carrying member, a carriage bearing a pair of printing hammers having heads partially superimposed and a fixed interposer having a plurality of elements disposed between the type-carrying member and the hammers. Printing is effected by cooperation of the print hammers and the type-carrying member through the interposer.

3,698,530

CASE SHIFT CONTROL APPARATUS OPERABLE BY A CASE SHIFT KEY AND BY TYPE KEYS

Wolfgang Bonleitner; Kurt Chvatlinsky, both of Wilhelmshaven, and Walter Hanke, Sande, all of Germany, assignors to Olympia Werke Aktiengesellschaft, Wilhelmshaven, Germany

Filed Sept. 2, 1969, Ser. No. 854,612

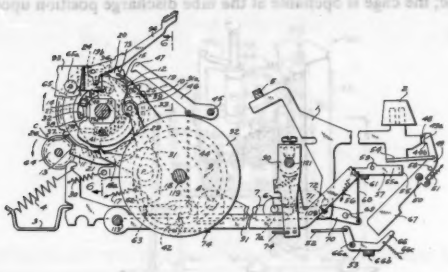
Claims priority, application Germany, Aug. 30, 1968, P 17 86 197.1

Int. Cl. B41j *25/24*

U.S. Cl. 197—71 **12 Claims**

The case shift means of a typewriter is operated by drive means through a gear clutch actuated by a shift key, or by an

other key moved beyond its depressed type actuating position. Interlock means prevent a typing operation during movement of the gear clutch and case shift means, and operation of the



case shift means while a type action is operated, but the case shift command is stored, and case shift takes place when the typing operation is completed.

3,698,531

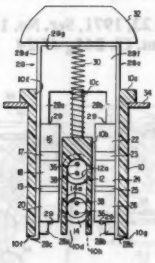
SOLID STATE SWITCH

Victor M. Bernin, Mt. Prospect, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Oct. 26, 1970, Ser. No. 85,182

Int. Cl. B41j *5/08*

U.S. Cl. 197—98 **14 Claims**



The disclosure describes a keyboard switch having two magnetic cores and a plurality of permanent magnets. The permanent magnets are mounted on a keystem and are movable with respect to the cores to change the flux density in the cores and thus vary the coupling between an AC drive winding and one or more secondary output windings threading each core. Non-magnetic regions separate the permanent magnets and these regions are positioned such that flux changes in one core, resulting from movement of the keystem, are out of phase with the flux changes in the second core. The output signal from one core may be used to strobe or sample the output signals appearing on the secondary windings of the other core. When a plurality of the switches are incorporated in a keyboard, the switches possess an inherent "roll-over" capability. The disclosure also describes a keyboard circuit employing a plurality of the switches.

3,698,532

KEYBOARD FOR A TYPEWRITER

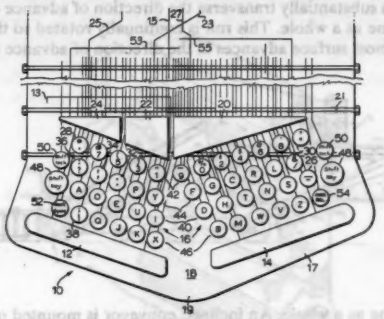
Irvine Dodds, 1132 Morrison Street, Niagara Falls, Ontario, Canada

Filed Aug. 21, 1969, Ser. No. 851,879

Int. Cl. B41j *5/10*

U.S. Cl. 197—100 **6 Claims**

A typewriter keyboard includes a plurality of rows of keys with two elongated typewriter mechanism actuating bars positioned forwardly of the keys of the keyboard. The first bar extends at least part way across one-half of the width of the keyboard and the second bar extends at least part way across



the other half of the width of the keyboard. One bar operates a space mechanism and the other operates a carriage return.

3,698,533

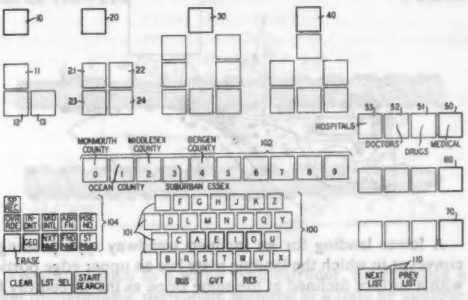
KEYBOARD ARRANGEMENT

Howard Clayton Illig, Rumson; Wilfred Emile Lehder, Jr., Middletown; James Daniel Parker, III, Sea Bright; Alfred Michael Santacroce, Eatontown, and James Arthur Sheridan, Englishtown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 15, 1970, Ser. No. 46,284

Int. Cl. B41j *5/10*

U.S. Cl. 197—100 **4 Claims**



The alphabetic keys of a keyboard adapted for coded alphanumeric input are arranged in four staggered rows so as to be operated by the right hand, with the home row including the vowel letter keys A, E, I. O and U, and with the remaining letter keys arranged relative to the home row according to their frequency of use. The numerical keys 0 through 9 are arranged in a single row approximately centered above the alphabetic keys. Various directional and functional keys are arranged so as to be operated by the left hand to indicate the direction or field of the alphanumeric keys operated by the right hand.

3,698,534

MEANS FOR CONSECUTIVELY GATHERING SEPARATED ROLLS OF SOD AND CONTINUOUSLY ELEVATING THE SAME TO THE LEVEL OF AN ACCOMPANYING VEHICLE

Glen R. Hadfield, 4643 Sherwood, Oxford, Mich.

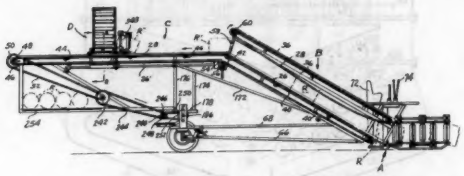
Continuation-in-part of Ser. No. 828,897, May 29, 1969, abandoned. This application May 15, 1970, Ser. No. 37,821

Int. Cl. B65g *67/22*

U.S. Cl. 198—9 **8 Claims**

Means for gathering rolls of sod from the ground. The rolls are in spaced rows and the rolls of each row are separated by

substantial distances. The rolls of each row have their axes parallel to the direction of advance of said gathering means. The gathering means comprise at least one leading roll having its axis substantially transverse the direction of advance of the machine as a whole. This roll is continually rotated so that its lowermost surface advances in the direction of advance of the



machine as a whole. An inclined conveyor is mounted on the machine and receives rolls of sod which are progressively lifted from the ground by said first-named roll and delivered to said conveyor. Means are provided at the upper end of the conveyor for presenting the rolls gathered to workmen stationed on the accompanying vehicle.

3,698,535

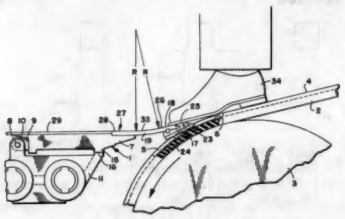
PASSENGER CONVEYOR LANDING

Ernest D. Johnson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 4, 1970, Ser. No. 86,749

Int. Cl. B66b 9/12

U.S. Cl. 198—16 R **4 Claims**



A lower landing for an inclined treadway type passenger conveyor in which the landing plate has an upper edge portion with a surface inclined at the same slope as the threadway for receiving passengers and objects from the treadway and a curved portion having a continuous surface for transferring passengers and objects from the inclined position to the horizontal position with a resultant motion for keeping the passengers' balance, the width of the upper edge portion and the curved portion being such that a passenger with a normal stride can step over them on entering or leaving the conveyor.

3,698,536

BOBBIN TUBE DELIVERY MEANS

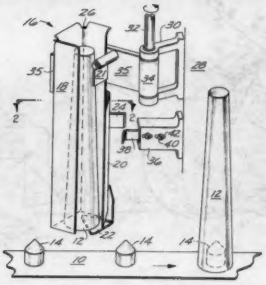
Lester W. Pray, Clemson, and Clinton C. Zerfoss, Liberty, both of S.C., assignors to Maremont Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 865,943, Oct. 13, 1969, Pat. No. 3,603,440. This application June 22, 1971, Ser. No. 155,414

Int. Cl. B65g 47/22

U.S. Cl. 198—26 **10 Claims**

A bobbin tube delivery assembly is disclosed for the delivery of bobbin tubes in an axially upright position to a tube donning apparatus servicing a textile machine, wherein a pivotable tube cage having an open side, top and bottom receives tubes one at a time, and pivots to an indexed tube discharge position over one of a plurality of pegs on a moving conveyor; during receipt and pivoting, the cage is closable at the open side and bottom sufficiently to retain a tube therewithin by means of a spring biased gate which at these times overextends the open side, a bottom flange which at these times underlays the open bottom and is attached to the gate; the cage is openable at the tube discharge position upon



pivoting thereto by abutment of a "key" flange element attached to the gate with some fixed stationary element such as a flange or bracket fixed to a frame wall, and thereat the tube falls upon a peg passing therebeneath and is carried by the conveyor out through the open side of the cage to the donning apparatus.

3,698,537

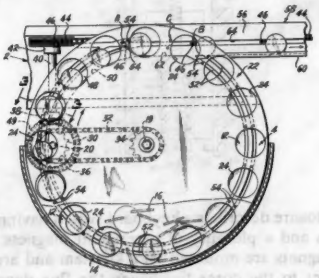
COIN SORTING AND CONVEYING APPARATUS

Thomas J. Black, Reston, and Werner H. Schmitt, Falls Church, both of Va., assignors to Werner F. Westermann, Falls Church, Va.

Filed June 23, 1971, Ser. No. 155,983

Int. Cl. B65g 47/24

U.S. Cl. 198—33 AA **9 Claims**



A tilted disc having openings therein rotates against a surface of a base member and the openings receive coins from a hopper and slide them upwardly along the surface. An upper portion of the surface slopes away from the disc and pins on the disc continue to propel the coins even though the coins have passed completely through the disc. The coins are propelled into the path of lugs on a linear conveyor moving at high speed and the parts are timed so that a lug engages a coin while it is still in contact with a pin and the lug accelerates and propels the coin along a linear path, thus the coin is always under the positive control of guiding and propelling means.

3,698,538

PNEUMATIC ROLL DEVICE FOR DOCUMENT HANDLING APPARATUS

Eugen Groeber, Salt Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

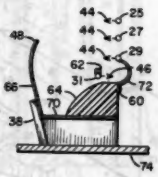
Filed March 10, 1971, Ser. No. 122,955

Int. Cl. B65g 41/24

U.S. Cl. 198—33 AD **6 Claims**

A pneumatic device that receives spaced, singulated lettermail documents in a vertical on-long-edge attitude and per-

mits the documents to pass through in their entering attitude or pneumatically rolls the documents into a vertical on-other-



long-edge attitude in response to a stamp detector whereby all emitted letters are in a vertical on-long-edge attitude with the stamp in like face orientation is disclosed.

3,698,539

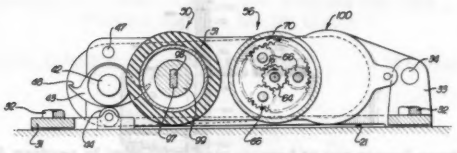
TORQUE CONTROLLED POWER ROLLER FOR CONVEYOR SYSTEM

John G. Schwarzbeck, Downey, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Continuation of Ser. No. 826,466, May 21, 1969, abandoned. This application July 6, 1971, Ser. No. 160,078

Int. Cl. B65g *13/02*

U.S. Cl. 198—127 **18 Claims**



Torque controlled power roller for conveyor system to move cargo or baggage containers, or other objects, over a conveyor platform, mountable below the plane of the platform supporting surface, with a power source which drives the roller and automatically lifts it into operating position through a transmission system embodying planetary gearing, the ring gear of the planetary set being arranged to provide force to lift the drive roller when the electric motor or other power source is started, and conversely allow the drive roller to drop out of engagement when the driving force ceases. The lifting force exerted is proportional to the driving torque on the roller; so that the more demanding the load, the more vertical up pressure forces will be imposed.

3,698,540

WEB SENSING MECHANISM FOR TRACKING SYSTEMS

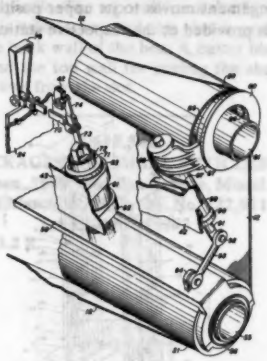
William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1970, Ser. No. 102,489

Int. Cl. B65g *15/62*

U.S. Cl. 198—202 **4 Claims**

A web sensing mechanism for use with the edge of a moving web to sense its deviation from a desired predetermined path of movement. The mechanism includes a ring formed with a tapered inner edge engageable with the sensed edge of the web and which is arranged generally concentric with the axis of a roller around which the web is guided. The ring is



mounted for rotation on the end of a control lever which actuates means for correcting the web deviation.

3,698,541

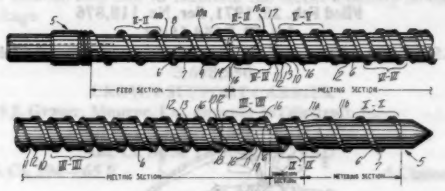
EXTRUDER, OR EXTRUDER-LIKE MELTING APPARATUS

Robert Alan Barr, Warren, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 799,430, Feb. 14, 1969, abandoned. This application Aug. 11, 1971, Ser. No. 171,021

Int. Cl. B65q *33/00*

U.S. Cl. 198—214 **3 Claims**



Apparatus, such as a screw type extruder, for reducing a solid thermoplastic particulate material to a fluid by continuous separation of the fluid component from the solid component of the material approximately as rapidly as formed.

3,698,542

CONVEYING ARRANGEMENT

Herbert Reger, Moglingen, and Hans-Walter Heinrich, Ochtersum, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 29, 1970, Ser. No. 76,363

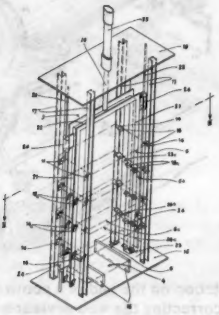
Claims priority, application Germany, Oct. 25, 1969, P 19 53 772.5

Int. Cl. B65g *25/08*

U.S. Cl. 198—225 **8 Claims**

A conveying arrangement for conveying articles from a lower to a higher level. An upright frame has a lower terminal station and an upper terminal station and at least one intermediate station which is located between and equally spaced from both terminal stations by a first distance. A lift arrangement is guided in the frame for alternate movement in a predetermined path between a lower and an upper position by a distance which is slightly greater than the first distance. The lift arrangement has a lower and at least one upper transfer level which in the lower position are respectively located slightly below the lower terminal station and the intermediate station, and which in the upper position are respectively

located slightly above the intermediate station and the upper terminal station. First detent means is provided at the respective transfer levels for supporting articles to be conveyed as the lift arrangement moves to its upper position. Second detent means is provided at the respective stations of the frame



and permits upward movement of articles supported by the first detent means but intercepts and retains such articles at the respective stations when the lift moves to its lower position. Moving means moves the lift between the positions thereof.

3,698,543

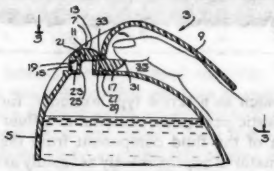
SAFETY CONTAINER

Frank A. Trotta, 330 West 87th Street, New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,876

Int. Cl. B65d *55/02*

U.S. Cl. 206—42 **9 Claims**



A container having safety means to prevent children from gaining access to the contents of the container. The safety means is comprised of a protective covering having an access passage arranged therein through which an adult's finger can enter and a closure-closure opening mechanism for the container.

3,698,544

BOOK-TYPE CARTON

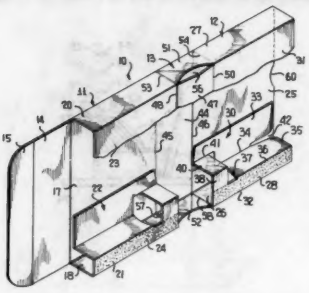
Lawrence J. Growney, Pearl River, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 19, 1969, Ser. No. 884,485

Int. Cl. B65d *5/50*

U.S. Cl. 206—45.11 **4 Claims**

This disclosure relates to a book-type carton which is basically formed of two hollow sections constructed to have positioned therein articles to be dispensed with the articles being displayed. Each of the carton sections includes an article support, and the carton is readily foldable to a closed position with the carton including a closure panel which is readily interlockable with one of the article supports in a novel manner



which in no way detracts from appearance or strength of the carton.

3,698,545

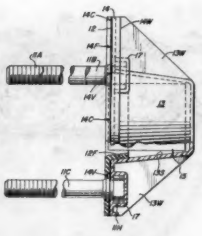
SHIPPING COVER FOR AB TYPE CONTROL VALVE

Robert W. MacDonnell, Crete, Ill., assignor to Unity Railway Supply Co., Inc., Chicago, Ill.

Filed May 21, 1971, Ser. No. 145,777

Int. Cl. B65d *81/02, 85/02, 85/30*

U.S. Cl. 206—46 H **11 Claims**



A shipping cover for railroad air brake control valves is provided for protecting the operating mechanisms of the valve during shipment and storage. Several embodiments of shipping covers specifically designed for an "AB" type valve service portion are made of high strength plastic and characterized by a unique cambered or wave-like contact face that provides complete sealing. The shipping covers can withstand high impact such as due to accidental dropping and the resilience of the covers helps to protect the valve structure against such impacts.

3,698,546

SPOOL AND COVER ASSEMBLY

David Kass, 5 Schench Avenue, Great Neck, N.Y.

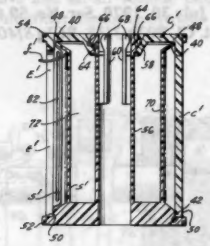
Filed Oct. 8, 1970, Ser. No. 79,229

Int. Cl. B65d *85/04*; B65h *55/00, 75/02*

U.S. Cl. 206—52 W **8 Claims**

A spool and cover assembly for wound filamentary material, such as thread, yarn and the like having a winding core section and end head sections, and a cover for the spool mounted and encasing the spool, the spool and cover being provided with mating seating areas at their opposite ends for frictionally mounting the cover on the spool, the cover and spool being

mounted for relative rotation one with respect to the other about the axis of the winding core section, the cover section



being formed with an egress orifice for the spool wound filamentary material.

3,698,547

PACKAGING APPARATUS, METHOD AND BAGS

John T. Roberts, 207 Aster Drive, Simpsonville, S.C., and Ralph L. Wing, 151 Bridgewater Drive, Greenville, S.C.

Division of Ser. No. 666,854, Sept. 11, 1967, Pat. No. 3,552,090. This application May 7, 1970, Ser. No. 47,926

Int. Cl. B65d *73/00*

U.S. Cl. 206—57 A **7 Claims**

A package of imbricated bags secured to two spaced-apart strands of tape with the extremity of each of the strands of tape being secured together and attached to a rotatable spool.

3,698,548

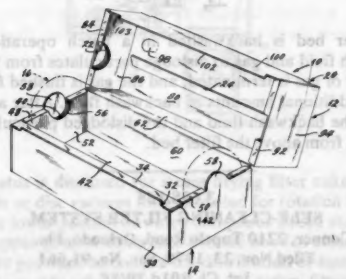
BOX FOR DISPENSING FLEXIBLE SHEET MATERIAL

Robert N. Stenzel, 745 Southside Drive, St. Louis County, Mo., and Donald W. Stenzel, 9839 Pebblestone Drive, St. Louis County, Mo.

Filed June 15, 1970, Ser. No. 46,067

Int. Cl. B65d *85/66*

U.S. Cl. 206—58 **9 Claims**



A box has front, back, top, bottom, and end walls arranged in a box-like configuration and contains a roll of sheet material, through which a spindle extends. The end walls of the box comprise several plies of paperboard material and some of these plies are provided with cutouts which form a cradle for the ends of the spindle. The top wall has a slot from which the sheet material is withdrawn, and this slot is positioned forwardly from the back wall of the box. A cutter blade projects upwardly beyond the top wall for cutting the sheet material after it is withdrawn from the slot.

3,698,549

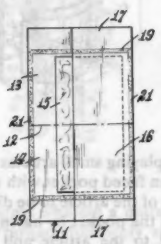
PACKAGES FOR SMALL ARTICLES

Jacob A. Glassman, 1680 Meridian Avenue, Miami Beach, Fla.

Filed March 10, 1971, Ser. No. 122,911

Int. Cl. A61b *19/02*

U.S. Cl. 206—63.2 R **4 Claims**



A flat disposable package for surgical supplies having front and rear panels firmly attached one to the other and having an internal pocket on one side edge to receive a side margin of the article or articles contained therein. The package also has pull tabs on one end to facilitate the sterile opening of the package.

3,698,550

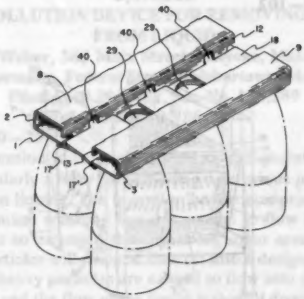
CROWN-SUPPORT CARRIER

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc.

Filed Aug. 23, 1971, Ser. No. 174,074

Int. Cl. B65d *71/00*; B66f *19/00*

U.S. Cl. 206—65 E **6 Claims**



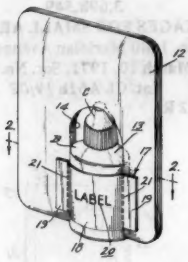
An improved multiple-article carrier of the crown-support variety comprising a bottom panel, side wall panels, crown cover panels, elevation panels, a securing panel and a top panel. The elevation panels are disposed along the inner edges of the article crowns and lie in a plane substantially parallel with the planes of the side wall panels and are provided with means for locking under the crowns of the articles in the carrier. The top panel also locks to one of the elevation panels and both elevation panels lock to the bottom panel thereby providing a tightly locked multiple article carrier.

3,698,551

DISPLAY PACKAGE AND LABEL

Harold W. Tomlinson, 27 Longwood Drive, Delmar, N.Y.

Continuation-in-part of Ser. No. 799,037, Feb. 13, 1970, Pat. No. 3,540,583. This application Oct. 22, 1970, Ser. No. 82,915
Int. Cl. B65d 73/00, 75/54
U.S. Cl. 206—80 R 14 Claims



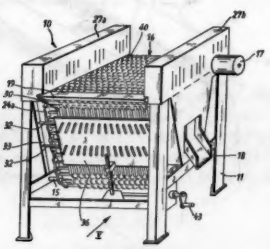
A package for displaying small articles comprising a display board having an open faced pocket with a width approximately equal to the width of the article to be displayed. A label strip retains the article in the pocket by having a central label portion firmly adhered to the article and end portions firmly secured to the display board and designed so that the label strip may be severed on either side of the central label portion, permitting removal of the article from the board and maintaining the central portion of the label strip as a permanent label for the article. Where the article is a container having a closure, the label strip may include a tab or other portion which bridges the joint between the body of the container and the closure to provide a tamper-proof seal for the closure.

3,698,552

SORTING MACHINE

Paul Wittmann, Hertlingsweg B 120¼ Neuburg/Danube, Germany

Filed Dec. 21, 1970, Ser. No. 100,190
Claims priority, application Germany, Dec. 29, 1969, P 19 65 243.8; March 17, 1970, P 20 12 654.9
Int. Cl. C10g 37/00
U.S. Cl. 209—102 13 Claims



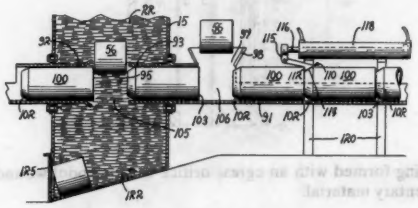
A sorting machine having a plurality of parallel rollers, all being supported by chain means, which form them into an endless belt and each supporting a plurality of spaced, double-conical sectional discs; guide rails for the discs for adjusting the positions of the discs along their rollers; slotted guide plate means connected with the rails for readjusting the positions of the rails, thereby to readjust the positions of the sectional discs. A plurality of sorting machines may be arranged in a row, each with means for providing a transition to the succeeding machine.

3,698,553

ARTICLE ELEVATING DEVICE

Ralph Minnite, P.O. Box 198, Cantua Creek, Calif.

Filed July 30, 1970, Ser. No. 59,655
Int. Cl. B03b 3/38; B63g 8/40
U.S. Cl. 209—173 10 Claims



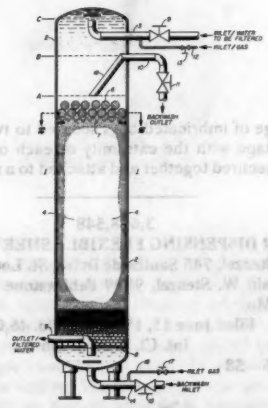
An article elevating device for buoyant articles and the like providing a column of liquid having predetermined upper and lower ends and an article injecting mechanism downwardly spaced from the upper end of the column for successively injecting a plurality of such articles into the column of liquid for automatic ascent through the liquid to said upper end of the column. Gas charged containers are also utilized to elevate non-buoyant materials in a similar manner.

3,698,554

METHOD FOR BACKWASHING FILTERS

Isaac Paul Mail, P.O. Drawer, Tulsa, Okla.

Division of Ser. No. 737,721, June 17, 1968, abandoned. This application April 27, 1970, Ser. No. 31,935
Int. Cl. B01d 23/24, 29/08
U.S. Cl. 210—80 2 Claims



A filter bed is backwashed in a batch operation with backwash fluid and gas to dislodge particulates from the bed. The flow of gas is terminated, and the gas is flushed from the bed by additional amounts of backwash fluid. After a settling period, the backwash fluid and the dislodged particulates are siphoned from above the filter bed.

3,698,555

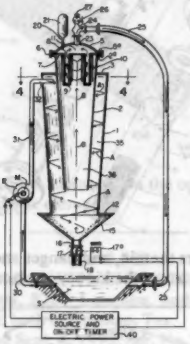
SELF-CLEANING FILTER SYSTEM

John R. Conner, 2210 Tupelo Road, Orlando, Fla.

Filed Nov. 23, 1970, Ser. No. 91,661
Int. Cl. B01d 29/38
U.S. Cl. 210—138 8 Claims

A filter system including permeable-surface filter means preceeded by cyclone-separator means and fitted with an elec-

trically operated drain valve at the bottom of a specially shaped dirt trap, the electrically operated valve, an air-admitting check valve and an air volume tank being combined with pumping-cycle timer means to provide an automatic self-



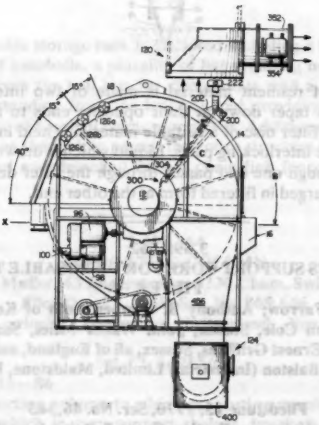
cleaning system in which a pumping and filtering cycle alternates with a filter-cleaning cycle to provide a frequently-cleaned efficient system especially useful for swimming pool filtration.

3,698,556

APPARATUS FOR STEAM DRYING FILTER CAKE

Robert C. Emmett, Jr., East Dundee, Ill.; Donald A. Dahlstrom, and John C. Brozovich, both of Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah

Filed Oct. 30, 1970, Ser. No. 85,321
Int. Cl. B01d *35/18*
U.S. Cl. 210—178 **14 Claims**



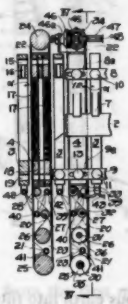
Apparatus is disclosed for steam drying filter cake formed on a drum or disc vacuum filter mounted for rotation in a container the lower portion of which comprises a feed slurry tank and the upper portion comprises a steam hood or steam dome. Means are provided to control the distribution of steam to the dome; to provide releasable seals for the rotary filter; to provide an improved steam hood; to provide exhaust means for the device and to provide an air cooler for the formed and heated filter cake.

3,698,557

CLARIFYING FILTER PRESS

Eiichi Ishigaki, Sakaide, Japan, assignor to Ishigaki Kiko Co., Ltd., Chiyuo-cho, Sakaide, Japan

Filed June 14, 1971, Ser. No. 152,904
Claims priority, application Japan, July 11, 1970, 45/61227; March 13, 1971, 46/13987
Int. Cl. B01d *33/00*
U.S. Cl. 210—225 **9 Claims**



A clarifying filter press wherein a plurality of filter frames and filter plates are arranged alternately, said filter frames and filter plates are connected with connecting means in such a manner that the filter frames and filter plates can be separated to give definite intervals therebetween, there are provided to each filter plate a set of endless filter mediums comprising two or more mediums which are trained over rollers so that said mediums cover both supporting beds of each filter plate with integrating to one another and are separated from one another under each filter plate, the filter mediums having been used for filtration are travelled after the filter frames and filter plates are separated, and the filter mediums are washed by washing devices provided on the way of separately travelling of the mediums. This clarifying filter press facilitates a large-scaled filtering treatment of liquid having extremely low content of slurry to a high clarification degree owing to filtration with two or more filter mediums which are integrated to one another.

3,698,558

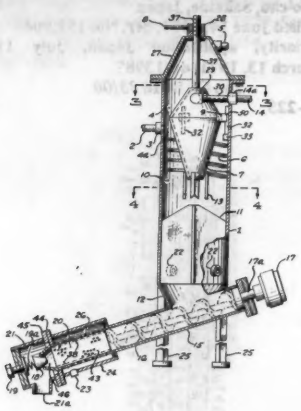
ANTI-POLLUTION DEVICE FOR REMOVING DEBRIS FROM LIQUID

Roland E. Weber, 363 Main Street, Holyoke, Mass., and Carl J. Zimmermann, Federal Street, Belchertown, Mass.

Filed April 29, 1971, Ser. No. 138,589
Int. Cl. B01d *21/26, 29/42*
U.S. Cl. 210—256 **9 Claims**

This invention is concerned with an anti-pollution device, and particularly a filter for removing deleterious particles and matter from liquids. The invention herein comprises a system and mechanism whereby liquid is caused to flow into a tank. The tank is so arranged that it has an upper area where the floating particles will rise and flow off into a designated receptacle. The heavy particles are caused to flow into a lower area in the tank and the flow of the liquid is slowed down by passing through helicoid ribs so that the heavy particles will have time to fall into a lower area and then into a chute in the bottom of the tank. Then particles are fed by a worm mechanism into a container whereby when enough of the particles have been deposited, the slurry of the particles will be caused to create a pressure so as to open up a valve. They then exit into a designated receptacle. The liquid itself flows into a chamber within the tank and through filtering means removing substantially all of the deleterious particles therefrom and out into a designated receptacle. The filtering means comprise two separate species. In one embodiment the liquid is slowed down by being fed into helicoid ribs around the inner chamber and is

further slowed down by fins attached to the bottom of the chamber and then caused to flow upwardly into the chamber and out through an opening. In another species the liquid



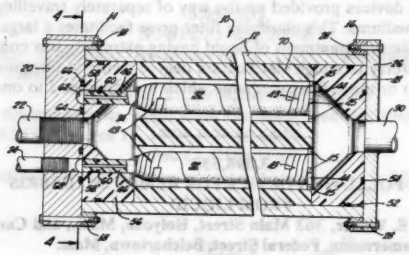
flows through diatomaceous earth into filter screen tubes and then passes into an upper chamber and out through an opening.

3,698,559

REVERSE OSMOSIS MODULE SUITABLE FOR FOOD PROCESSING

Serop Manjikian, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Interior

Filed March 1, 1971, Ser. No. 119,737
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **8 Claims**



A reverse osmosis module has a pressure housing containing a number of RO elements with membrane covered outer surfaces. Inside the housing a stuffer surrounds the elements, with the interior surfaces of the stuffer spaced a uniform distance from the membranes. When liquid is passed through the module between the membranes and the stuffer, the spacing between them promotes controlled, uniform, liquid flow. The RO module is particularly suited for food processing.

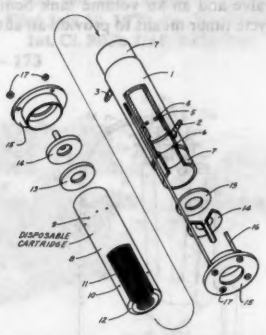
3,698,560

HOLLOW FIBER, ARTIFICIAL KIDNEY WITH DISPOSABLE DIALYZING CARTRIDGE

James S. Tapp, Decatur, Ala.; George L. Beemsterboer, and Ival O. Salyer, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed Dec. 28, 1970, Ser. No. 101,719
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **6 Claims**

A hollow-fiber, artificial kidney with a disposable dialyzing cartridge comprising a cylindrical body, a disposable dialyzing cartridge positioned during use within the body and having



hollow dialyzing fibers therein, and flanges and other means to hold the assembled parts of the kidney in place.

3,698,561

FILTERING PIPETTE

Arthur L. Babson, Chester, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 12, 1971, Ser. No. 142,711
Int. Cl. B01d *35/28*
U.S. Cl. 210—445 **3 Claims**

Pipette of resilient material is made of two interlocking parts which taper down at their opposite ends to a narrow opening. A filter disc of a suitable material is held in position between the interlocking parts. Liquid which is drawn into the pipette through one end passes through the filter disc before being discharged in filtered form at the other end.

3,698,562

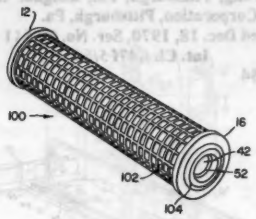
POROUS SUPPORT CORE FOR DISPOSABLE TUBE FILTER

Roger M. Farrow; Anthony B. Kimber, both of Kent; John Barrington Cole, Sussex; John Walter Miles, Sussex, and Graham Ernest Griffiths, Sussex, all of England, assignors to W. & R. Balston (Industrial) Limited, Maidstone, Kent, England

Filed June 15, 1970, Ser. No. 46,343
Claims priority, application Great Britain, June 17, 1969, 30,646/69
Int. Cl. B01d *27/00*
U.S. Cl. 210—488 **15 Claims**

A porous support core is prepared from a synthetic polymeric material, which support core is adapted for use with disposable semirigid filter tubes, which core comprises a plurality of individual elements arranged in a stacked interlocking relationship, the elements so structured to form an axial passageway in the stacked elements and flow passages in the wall of the core so formed. The individual disc elements are

characterized by a central aperture to form an axial passageway, projecting partitions on one surface to form the



flow passage and hook elements on the opposite surface to interlock individual disc elements.

3,698,563

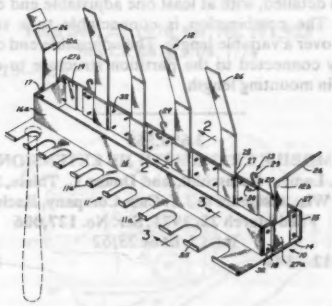
BASEBALL EQUIPMENT STORAGE RACK

George E. Gordon, 8207 Langdon, and Leon L. Landrum, 7715 La Roche, both of Houston, Tex.

Filed Sept. 8, 1970, Ser. No. 70,264

Int. Cl. A47f 7/00

U.S. Cl. 211—13 **16 Claims**



A portable storage rack is disclosed including a ball box for storage of baseballs, a plurality of bat retaining members extending from the ball box for storing bats, and a plurality of fingers extending from the ball box and providing hooks for the storage of baseball helmets or gloves. Additional hooks are provided on the rack to permit the entire structure to be readily attached and detached from a chain link fence or similar structure.

3,698,564

SUPPORTING COLUMN

Hermann Muller, 43 Zugerstrasse, 6330 Cham, Switzerland

Filed Oct. 27, 1969, Ser. No. 869,646

Claims priority, application Switzerland, Nov. 4, 1968, 16401/68

Int. Cl. A47f 5/00

U.S. Cl. 211—86 **10 Claims**

A supporting column to which supporting members are attachable which in turn support shelves, brackets, partitions and the like. The column comprises at least one longitudinal member composed of a sleeve provided therein with a lengthwise extending core having radial ribs, the outer edges of which engage tightly the inner wall of the sleeve. The sleeve is provided with at least one circumferential groove of a radial depth which is equal to the wall thickness of the sleeve so that the ribs on the core are exposed and support members may be inserted into the spaces formed between the radial ribs.

The longitudinal member preferably is made of at least two axially aligned and telescopically connected sleeves, each having a core with radial ribs therein. One sleeve has its core projecting from one of its ends to extend into the adjacent end of other sleeve which at this end has a portion of its core removed an axial distance which is shorter than the portion of

the core extending from the first mentioned sleeve, thereby forming a groove between the two telescopically connected sleeves which permits the attachment of supporting members to the exposed core portion.

3,698,565

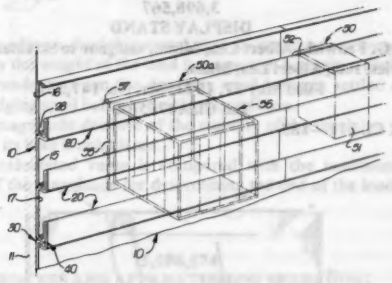
DISPLAY PANEL FOR MERCHANDISE OR THE LIKE

Karl F. Weber, 1290 Inverness, Pasadena, Calif.

Filed Aug. 7, 1970, Ser. No. 62,042

Int. Cl. A47f 5/08

U.S. Cl. 211—87 **10 Claims**



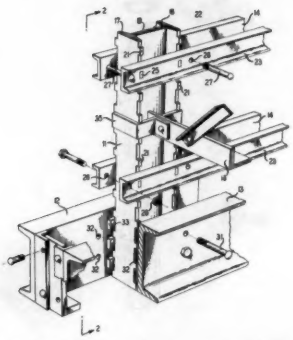
A unitary panel section has a continuous longitudinally extending horizontal male connecting member including a rib with an outwardly facing edge surface and an inwardly facing shoulder integrally joined at the upper edge of a vertical wall, the wall having a plurality of continuous longitudinally extending ribs extending outwardly therefrom to an outer edge, at which a longitudinally continuously extending upstanding flange extends upwardly to terminate in an upper edge spaced from the wall portion to provide lips each defining an upwardly opening trough, the panel section vertical wall at the lower edge thereof having integral upper and lower continuous longitudinally extending horizontal ribs defining a female connecting member channel opening to the back side of the wall, with a mating inwardly facing bottom surface and an outwardly facing shoulder. The panel sections may be connected along adjacent upper and lower longitudinal edges by the mating of the male and female connecting members to interlock the panel sections into a support panel for receiving the hooked ends of fasteners on the merchandise or the like to be displayed thereon. The panel sections may be rolled from sheet metal or extruded.

3,698,566

DEMOUNTABLE CANTILEVER STORAGE RACKS

Thomas N. D'Altrui, 667 Evergreen Parkway, Union, N.J.

Filed Jan. 7, 1971, Ser. No. 104,590
Int. Cl. A47f 5/10; F16b 7/18
U.S. Cl. 211—176 5 Claims



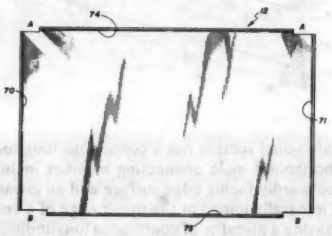
A demountable cantilever storage rack comprises a plurality of vertical posts, each having a plurality of key projections on opposite sides. Horizontal load bearing arms comprise a pair of horizontal members fitting on opposite sides of a vertical post and engaging corresponding key projections. Bolts on opposite sides of the vertical post extend through the two component members to clamp it securely to the post. The rack is stabilized by a pair of base members clamped to opposite sides of each vertical post and having lug projections nesting between successive key projections of the vertical post.

3,698,567

DISPLAY STAND

Jay G. Fenwick, Albert Lea, Minn., assignor to Streater Industries, Inc., Albert Lea, Minn.

Filed May 27, 1971, Ser. No. 147,332
Int. Cl. A47f 5/00
U.S. Cl. 211—183 1 Claim



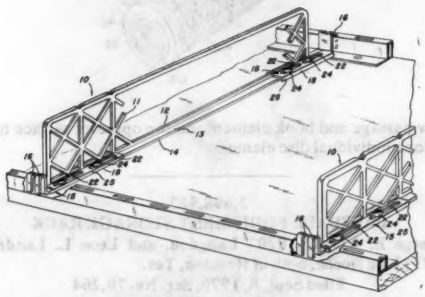
The invention relates to a display stand of the type commonly found in department stores which has two general forms known as wall cases and gondolas. This type of display stand has a base or platform having a height of about 6 or 8 inches from the floor. The base customarily has a base nose which has the general form of a longitudinally extending, rounded off protrusion extending from the upper portion of the base. Beneath or behind the base nose is a kick plate which, in conjunction with the base nose, forms a toe space. The invention is directed to a construction or arrangement in which it is optional for the kick plate to be installed in one way so as to be supported by the floor or in another way so as to be supported by base arms which in effect form the structural frame for the base.

3,698,568

PARTITION STRUCTURE WITH ADJUSTABLE END MEMBER

Blair D. Armstrong, Pittsburgh, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1970, Ser. No. 99,611
Int. Cl. A47f 5/00
U.S. Cl. 211—184 1 Claim



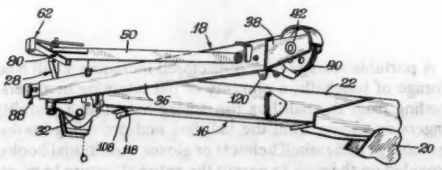
A partition structure combination for use with shelving or the like is detailed, with at least one adjustable end connector member. The combination is connectable to a supporting structure over a variable length. The adjustable end connector is slidably connected to the partition structure to effect the variation in mounting length.

3,698,569

MOBILE CRANE WITH JIB EXTENSION

Gerald P. Lamer, Rothschild, and Duane L. Thiele, Schofield, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed March 22, 1971, Ser. No. 127,006
Int. Cl. B66c 23/62
U.S. Cl. 212—144 14 Claims



A crane structure including a main boom comprised of a plurality of telescopically arranged boom sections, with a jib boom being connected to the main boom for movement between a usable position in alignment with the main boom and a storage position alongside of the main boom. The jib boom is connected to the main boom by an upright pivot, so that the jib boom swings in a generally horizontal plane in moving between the usable and storage positions. The connection of the jib boom to the main boom is detachable, so that the main boom section may be extended and retracted when the jib boom is in the storage position and the connection means is detached.

3,698,570

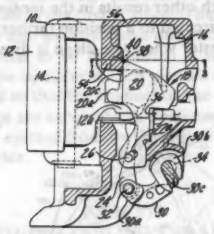
CAR COUPLER

William J. Metzger, East Cleveland, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 21, 1971, Ser. No. 145,710
Int. Cl. B61g 3/08
U.S. Cl. 213—146 8 Claims

A railway car coupler of the knuckle type in which improved fulcruming of the lock member during manual actua-

tion of the uncoupling mechanism to unlock and open the knuckle is provided to reduce the frictional drag between the lock and the coupler head. The lock member is provided with



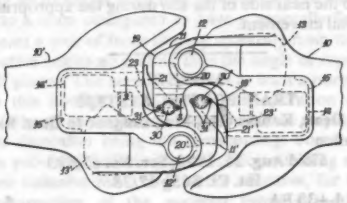
a fulcrum lug of a configuration which assures that the lock will fulcrum about the lug without frictional engagement occurring between the adjacent portions of the lock and the coupler head during unlocking and opening of the knuckle.

3,698,571

INTERLOCKING COUPLER

Vaughn T. Hawthorne, 5223 Deerfield Road, Mechanicsburg, Pa.

Filed Dec. 28, 1970, Ser. No. 101,923
Int. Cl. B61g *3/04, 7/14*
U.S. Cl. 213—153 **11 Claims**



The knuckle of a railway car coupler has a dog extending from its distal end, which dog is mounted for pivotal movement about a vertical axis. The dog enters a hole in the adjacent portion of a body of another coupler to prevent the separation of the couplers by vertical movements with respect to each other. The dog is resiliently urged into said hole and has a projecting surface which rides on the body about the hole to limit the penetration of the dog into the hole. The springs that provide this resilient urging are on the ends of a shaft pivotally mounting the dog in the knuckle and also permit vertical movement of the dog with respect to the knuckle. If there is excessive vertical travel of the dog in the aperture, cam faces on the top and bottom of the aperture force the dog outwardly.

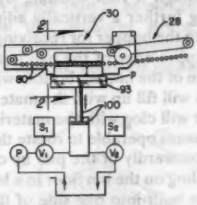
3,698,572

BAG COMPACTOR FOR CONVEYING APPARATUS

Billy J. Dahlem, Golden, and John A. Martin, Denver, both of Colo., assignors to Power-Curve Conveyor Company, Denver, Colo.

Filed Sept. 29, 1969, Ser. No. 861,979
Int. Cl. B65g *57/24*
U.S. Cl. 214—6 DK **1 Claim**

A pallet loader of the type having a pallet elevator onto which patterns of articles, such as sacked material, are successively deposited and incrementally lowered for receipt of additional patterns, the loader having a movable wall above the elevator on which a pattern is disposed for transfer to the elevator, characterized by an elevator motion control which compacts a pattern while on the elevator and against the lower face of said wall. Pressure sensing means are associated with



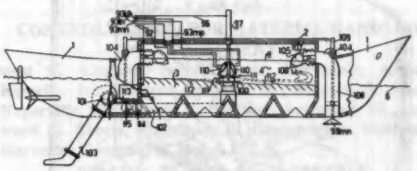
the wall for adjusting the force of compaction to a desired value.

3,698,573

METHOD AND APPARATUS FOR LOADING A DREDGING VESSEL WITH DREDGING SPOIL

Tjako Aaldrik Wolters, Vianen, and Romke van der Veen, Hesselaan, both of Netherlands, assignors to Ballast-Nedam Groep N.V., Amsterdam, Netherlands

Filed May 14, 1971, Ser. No. 143,440
Claims priority, application Netherlands, May 14, 1970, 70.06965
Int. Cl. B65g *27/00*
U.S. Cl. 214—15 B **4 Claims**



For loading a dredging vessel upto its maximum conveying capacity the weight of the load is measured, wherein a distinction is made between the dredging spoil being in settled and the dredging spoil being in fluidized condition.

The magnitude decisive of the stability of the dredging vessel with its load is calculated.

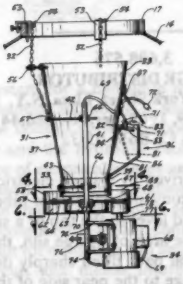
The calculated value is compared with the inadmissible value of the magnitude for determining the end of the loading process.

3,698,574

PROCESS AND APPARATUS FOR SPREADING GRANULAR MATERIAL

Robert A. Louks, Gilman, Iowa

Filed June 18, 1970, Ser. No. 47,402
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CB **5 Claims**



This invention relates to a process and an apparatus for spreading granular material for use primarily in a conventional

circular storage bin having a floor and a material evacuating unit: the apparatus having a hopper for receiving the material dumped therein through a roof opening by a conventional elevator, and having further a vertically adjustable rotatable pan disposed beneath the hopper for receiving and holding the material, with the upper edge of the pan outer wall disposed above the lower edge of the hopper bottom whereby the pan is not rotated, the pan will fill up with the material and then the throat of the hopper will clog with the material, and including further motorized means operable to rotate the pan so that the material is thrown outwardly of the pan by centrifugal force, the material then falling on the bin floor in a level manner.

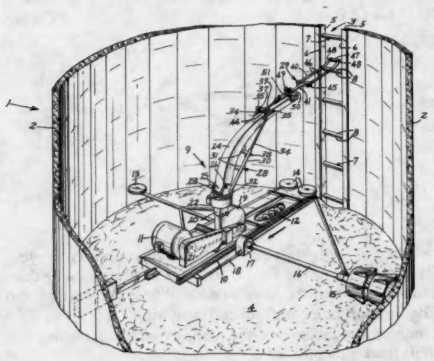
A switch device is built into one side of the hopper and is responsive to material clogging up the hopper to automatically turn on the motor so as to rotate the pan, thus insuring that no material is discharged into the bin unless the spreader is operating at full capacity.

3,698,575

AUTOMATICALLY LOWERING UNLOADER

Robert F. Koser, P.O. Box 135, Almena, Wis., and Jack D. Messner, Wayzata, Minn., assignors to said Koser, by said Messner

Filed July 24, 1970, Ser. No. 57,949
Int. Cl. B65g *65/38*
U.S. Cl. 214—17 DB **8 Claims**



An automatically lowering silo unloader for use in a silo having a discharge door opening that extends vertically for the greater portion of the height of the silo and having a plurality of vertically spaced narrow bridging members extending horizontally across the opening. The unloader includes a discharge chute that is disposed to direct silage generally radially of the silo upwardly through the vertically-extended opening, and torque arm means engageable with a side edge of the opening to automatically hold the discharge chute against rotation with the unloader and in line with the opening as the unloader moves downwardly within the silo during unloading of silage therefrom.

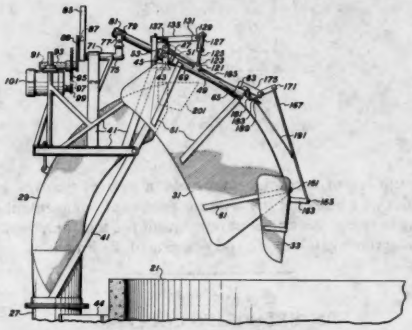
3,698,576

SILAGE DISTRIBUTOR

Erwin H. Gillette, 1711 York Street, Lima, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,441
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 C **13 Claims**

A shifting deflector, driven by a small electric motor, is attached to the top of the conventional blower tube which blows silage up from the ground level to the top of a silo. To spread the silage evenly over the area of a large silo, the deflector is moved through an orbital path tilted sharply downwardly to deflect the incoming silage to the near side of the silo, during part of the orbital movement, and raised up to an almost horizontal position for deflecting the incoming silage to the far side of the silo, and moving through various intermediate positions to direct the silage rightwardly and leftwardly. A crank arm driven by an electric motor operates a follower crank arm eccentric to the first crank arm, which controls the orbital position of the deflector, and the eccentricity of the two crank arms relative to each other results in the motion being slower when the silage is directed to a position farther away from the blower tube, and faster when the silage is directed to a posi-



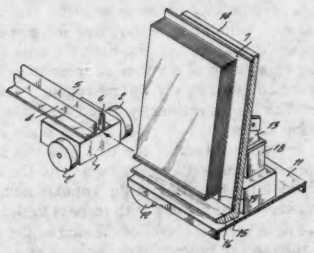
tion closer to the blower tube, thus producing a more even filling throughout the entire area of the silo. The orbital movement produced by the crank arms includes a lateral twisting motion superimposed on the main orbital motion. A supplementary deflector pivoted to the discharge end of the main deflector is operated by a linkage to assist in directing the flow of silage to the near side of the silo during the appropriate part of the orbital movement.

3,698,577

TRANSPORTING SYSTEM

George A. Dean, Kansas City, Mo., assignor to Dean Research Corporation

Filed Aug. 21, 1970, Ser. No. 65,893
Int. Cl. B65g *67/28*
U.S. Cl. 214—38 BA **5 Claims**



The system comprises a container, a transporter and, optionally, an upender. The transporter is comprised of a first base mounted on wheels and two side members mounted on the first base. The side members form therebetween a channel. The container has a back and a first rest. The first rest is fixed to the back and is preferably substantially perpendicular thereto. A lower flange portion of the back is removably insertable within the channel. The channel side members are equal in height so that when the flange portion is within the channel, the sheet material is supported therein by the container so that the sheet material is substantially parallel to the back of the container. Alternatively, one channel side member may be higher than the other so that when the flange portion is within the channel, the container is supported therein, preferably at an angle of 5°–7°. The upender comprises a second base mounted on wheels, an upright member fixed to

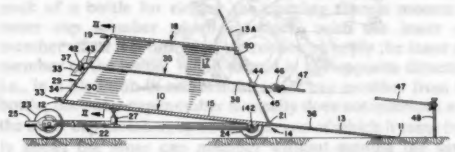
the base and an arm pivotally fixed to the upright member. A second rest having a first face is fixed to the arm. The arm is pivotable from a first horizontal position to a second vertical position. Sliding means may be provided in the channel and on the first face to facilitate removal of the container. The upender is placed in the first position. The container is placed on the upender arm with its flange directed toward the second rest. The material to be transported is stacked on the container back. The upender is then pivoted to the second position and moved so that the channel on the transporter and the container flange are substantially in alignment. The container is then slidably ejected from the upender rest into the channel on the transporter.

3,698,578

FEEDSTUFF HANDLING AND APPARATUS

William J. Flittie, 7820 Southwestern, Dallas, Tex.

Filed Oct. 28, 1970, Ser. No. 84,755
Int. Cl. B65g *67/26*
U.S. Cl. 214—58 **70 Claims**



A feedstuff handling apparatus provided with means for receiving an inflow of vegetable feedstuff pieces and forming them into a mass configured to have a generally flat bottom and at least a pair of faces sloping upwardly from the bottom at respective angles no greater than the angle of repose of the feedstuff pieces. The apparatus holds at least a portion of the mass in this configuration during the operation of means which discharge the mass onto the ground, the sloping faces of the mass thereafter being left freestanding. Some modifications are provided with simple means for attaining a uniform and more cohesive mass and, where effective, for obtaining some compaction of the material forming the mass. A preferred mode of covering the mass or for sealing it off from the air is described, in connection with which are disclosed features of the apparatus operative for smoothing a ground area designated for reception of the feedstuff mass and for mechanically accomplishing part of the labor involved in the covering or sealing operation. According to certain aspects of a feedstuff handling method (of which the apparatus forms an example of means of implementation), feedstuff pieces are formed into a mass of the above-noted configuration and all upwardly inclined faces of the mass are supported until completion of discharge of the mass from one surface on which it is formed to another surface. After discharge, the mass faces extending at an angle to the mass bottom face no greater than the angle of repose of the feedstuff pieces of the mass are left unsupported; support is continued for any faces of the mass which extend upwardly at a greater angle. According to one version of the method, final shaping of the mass is accomplished concurrently with discharge of the mass.

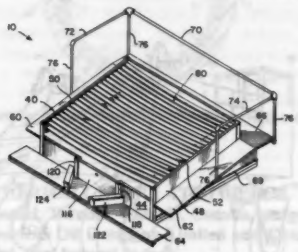
3,698,579

FRUIT HARVESTER

Ellis Peek, Jr., R.R. #3, Shoals, Ind.

Filed Sept. 28, 1970, Ser. No. 76,166
Int. Cl. B60p *1/00*
U.S. Cl. 214—83.1 **10 Claims**

A fruit picker assembly comprising a frame, a box mounted on the frame, the box having a bottom, front and back walls, side walls, and at least a partially open top, means defining a walkway extending perimetrally about at least a portion of the box and movable therewith, and means for breaking the fall of fruit dropped into the box. The breaking means includes a plurality of straps extending transversely across the open top of the box with the spacing between adjacent straps being less than the diameter of the fruit to be picked and with the straps being flexible so that adjacent straps are separated by dropping the fruit thereon to permit the fruit to move therebetween into the box. I provide padded breaker panels or



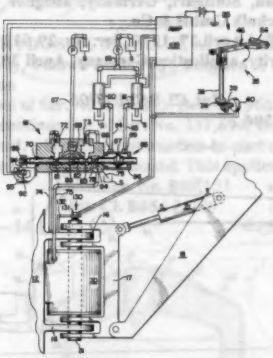
breaker walls disposed inside the box under the straps to guide the fruit falling through the straps toward the rear of the box. I also provide means for mounting the frame on a conventional front end loader of a farm tractor for pivotal movement about a generally horizontal axis, and motor means for selectively adjustably positioning the frame relative to such a front end loader and about the axis.

3,698,580

CONTROL SYSTEM FOR MATERIAL HANDLING EQUIPMENT

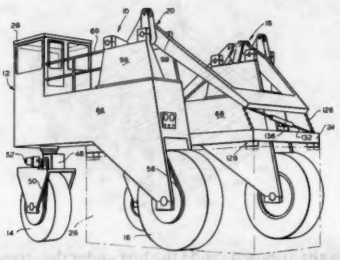
Ernest C. Carlson, Schwetzingen, Germany; Arthur J. Howells, Jr., Western Springs, Ill.; Marvin D. Jennings, Naperville, Ill.; Donald R. Eastman, Lockport, Ill., and Edward G. Sheets, Plainfield, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 22, 1969, Ser. No. 887,013
Int. Cl. E02f *3/28*
U.S. Cl. 214—138 R **11 Claims**



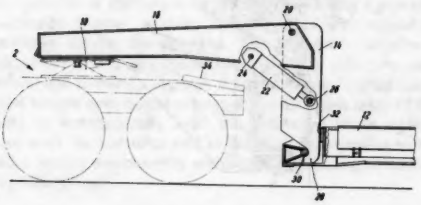
A control system for a hydraulic motor actuated material handling mechanism including a source of fluid power, a directional flow control valve interposed between the source of fluid power and the hydraulic motor, a bridge circuit including a source of electrical energy and having a first variable impedance branch varied by a command control lever and a second variable impedance branch associated with the flow control valve, comparator means connected to the output of the bridge circuit for detecting and amplifying an unbalance in the bridge circuit and means interconnected between the comparator and the directional flow control valve for controlling said valve in a manner corresponding to command movement of the variable impedance branch.

3,698,581
VAN CARRIER VEHICLE
Wynand M. J. M. Goyarts, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Feb. 16, 1971, Ser. No. 115,457
Int. Cl. B60p 1/64
U.S. Cl. 214—394 12 Claims



A self-propelled van carrier vehicle having a rearwardly opening U-shaped chassis on the legs of which are located a pair of short stroke hydraulic cylinders for actuating longitudinally extending U-shaped opposed lift levers. Depending from the lift levers is a lifting frame which is adapted to engage, lift and transport large containers and to stack them at least two deep. Operator controlled adjustable means is provided between the lifting frame and the lever arms for adjusting the lifting frame transversely of the vehicle or skewing it in relation to the vehicle. Improved mechanical load distribution means is operative to aid in equalizing the effective load both transversely and longitudinally of the vehicle when the load as supported on the lifting frame is eccentric or offset in any direction in relation to the center of gravity of the lifting frame.

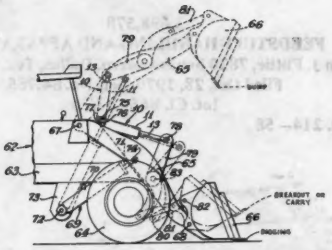
3,698,582
ARTICULATED VEHICLES
Karl Weinmann, Stuttgart, Germany, assignor to KAMAG Transporttechnik GmbH & Co.
Filed April 17, 1970, Ser. No. 29,612
Claims priority, application Germany, April 26, 1969, P 19 21 477.8
Int. Cl. B62d 53/06
U.S. Cl. 214—506 10 Claims



A rear-wheeled load-carrying frame of a low-bed type trailer is connectible to a saddle tractor by a support frame. The support frame has a horizontal arm adapted to rest on the saddle of the tractor and a normally vertical beam hinged to the rear end of the horizontal arm. The lower end of the beam has at least one hook shaped claw adapted to engage behind a corresponding coupling pin on the forward end of the load-carrying frame and engages a stop face on said forward end when the beam is in its normal vertical position. A hydraulic jack is provided between the arm and the beam.

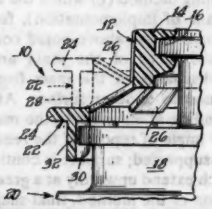
Preferably a steering mechanism for a rear bogie on the load-carrying frame includes a vertical steering shaft journalled in the beam and having a coupling arm automatically engageable with a coupling piece connected by a steering linkage to the bogie.

3,698,583
AUTOMATIC BUCKET POSITIONING DEVICE
Daniel B. Shore, Niles, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Sept. 14, 1970, Ser. No. 71,778
Int. Cl. E02f 3/00
U.S. Cl. 214—764 5 Claims



Hydraulic means operating in conjunction with a hydraulic power unit for automatically stopping in an intermediate position a device whose position is controlled by the hydraulic power unit. A digging bucket is automatically stopped at a digging position intermediate to dumping and breakout positions with respect to a boom arm. A pilot valve connected to an intermediate region of a cylinder of the hydraulic power unit regulates the control valve for the power unit.

3,698,584
TAMPERPROOF CLOSURE DEVICE
Christian F. Miller, Palos Park, Ill., assignor to V.C.A. Corporation, Greenwich, Conn.
Filed Oct. 9, 1970, Ser. No. 79,429
Int. Cl. B65d 43/02
U.S. Cl. 215—9 9 Claims



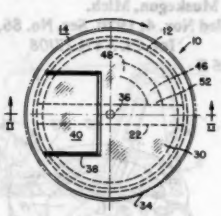
The present invention relates generally to tamperproof closure devices and more particularly to tamperproof closure devices for externally threaded containers. An embodiment of the invention disclosed herein includes an internally threaded cap section, a peripheral locking section and means coupling the locking section with the cap section in such a manner as to permit limited axial displacement of the locking section with respect to the cap section. Abutment means associated with the locking section is adapted for locking engagement and disengagement with respect to complementary abutment means associated with the container when the locking section is in a given axially displaced position.

3,698,585

SAFETY CONTAINER TOP

Bernard Smith, 7102 Plymouth Road, Baltimore, Md., and Anthony J. De Pietro, 208 School Lane, Springfield, Pa.

Filed Feb. 18, 1971, Ser. No. 116,418
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 15 Claims



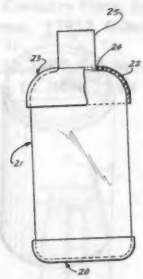
An inner cap member adapted for being threaded onto the neck of a bottle for closing the opening therein mounts an outer cap member which interlocks with the inner cap member when it is turned in a direction to apply the inner cap member to the bottle. When turned in the opposite direction, i.e., in a direction to remove the inner cap member from the bottle, the outer cap member normally does not interlock with the inner cap member, as a consequence of which it turns freely about the inner cap member without turning the same. However, it may be made to interlock with the inner cap member when it is desired to remove the same from the bottle.

3,698,586

PLASTIC ENCASED GLASS CONTAINER

E. M. Terner, Oakhurst, N.J., assignor to Midland Glass Company, Inc., Cliffwood, N.J.

Filed Sept. 2, 1970, Ser. No. 68,931
Int. Cl. B64d *23/08*
U.S. Cl. 215—12 R 2 Claims



A glass container, such as a bottle, is encased in a plastic film in order to preserve the inherent strength of the glass. The film may be formed as a shrinkable sheath into which the container is placed, followed by heating, or a portion of the encasing material may be in the form of such a sheath, with the remainder of the film applied by a wrapping operation.

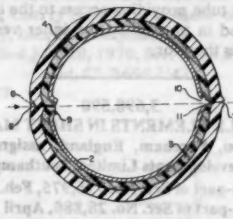
3,698,587

SELF SEALING COMPOSITE

Ronald E. Baker; Robert L. Fogarty, and Edwin C. Slagel, all of Phoenix, Ariz., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed June 18, 1970, Ser. No. 47,396
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 F 1 Claim

This invention relates to a self-sealing wall for containers and conduits comprising a substantially rigid supporting layer of liquid impervious material, a layer of foam and at least one



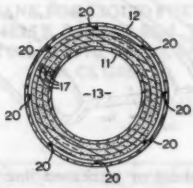
layer of a homogeneous elastomeric polyurethane adhered to the foam.

3,698,588

THERMALLY INSULATED DEVICE

Louis A. Pogorski, Toronto, Ontario, Canada, assignor to The British American Oil Company Limited and Chemical Projects Limited, part interest to each

Division of Ser. No. 765,471, Oct. 7, 1968, abandoned. This application Oct. 21, 1970, Ser. No. 82,567
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 C 2 Claims



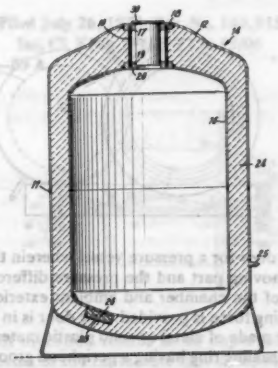
A thermally insulated device having an inner wall and an outer wall. A load-supporting thermal insulation is located between and contacts the inner wall only. The thermal insulation includes a flexible casing filled with compacted finely divided material. The thermal insulation is the sole supporting member bearing the load imposed by the inner wall.

3,698,589

CRYOGENIC STORAGE APPARATUS

James L. Perry, Totowa Buro, N.J., assignor to Union Carbide Corporation

Continuation of Ser. No. 599,343, Dec. 1, 1966, abandoned, which is a continuation of Ser. No. 337,696, Dec. 26, 1963, abandoned, which is a continuation-in-part of Ser. No. 149,356, Nov. 1, 1961, abandoned. This application Dec. 29, 1969, Ser. No. 888,151
Int. Cl. B65d *25/00*
U.S. Cl. 220—14 5 Claims



A double walled container having an inner vessel and an outer shell with an intervening vacuum insulation space, in-

cluding a neck tube formed of certain gas impervious fiber reinforced plastic compositions having certain physical properties, the neck tube providing access to the inner vessel and also being loaded in tension by the inner vessel as the sole suspension means therefor.

3,698,590

FRANGIBLE ELEMENTS IN SHEET MATERIAL

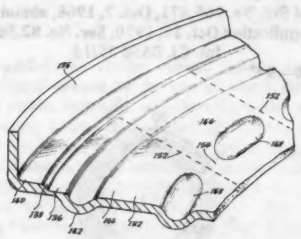
William Cookson, Fareham, England, assignor to Cookson Sheet Metal Developments Limited, Southampton, England

Continuation-in-part of Ser. No. 796,975, Feb. 6, 1969, and a continuation-in-part of Ser. No. 28,880, April 15, 1970. This application June 24, 1971, Ser. No. 156,294

Claims priority, application Great Britain, March 16, 1968, 7,698/68; Jan. 24, 1969, 4,248/69; Nov. 26, 1970, 56,335/70; June 15, 1971, 28,024/71; Jan. 15, 1970, 58/70; Australia, Jan. 22, 1970, 10545

Int. Cl. B65d *17/00, 17/20*

U.S. Cl. 220—27 **30 Claims**



A frangible element or weakened line in sheet material, especially tinplate, which is useful in opening means for containers. A method and apparatus for making the line is described. The frangible element lies between two portions of the sheet of greater thickness than the frangible element, to which it is joined by rounded steps or other rounded formations, and a hollow indentation, e.g., a bead, lies in one of the portions. By using a series of indentations, these can be arranged so that the opening of a tear-open panel in the container wall can be controlled more easily.

3,698,591

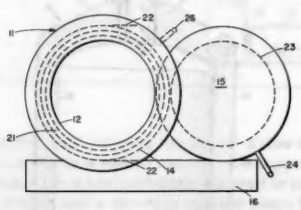
PRESSURE CHAMBER CLOSURE

Richard A. Morin, Snyder, and Edward H. Lanphier, Eggertsville, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 4, 1971, Ser. No. 103,664

Int. Cl. B65d *53/00*

U.S. Cl. 220—46 R **10 Claims**



An access door for a pressure vessel wherein the door itself is the only moving part and the pressure difference between the interior of the chamber and ambient exterior pressure is the only sealing force is provided. The door is in the form of a disc or wafer made of metal or solid plastic material and holds in position a sealing ring having a peripheral groove for receiving one O ring and a groove on the surface facing the door for receiving a second O ring. The door is rolled manually by a substantially radially extending handle. The chamber is cut to receive the door laterally and recessed internally to permit the sealing ring to be moved axially into sealing position in the recess.

3,698,592

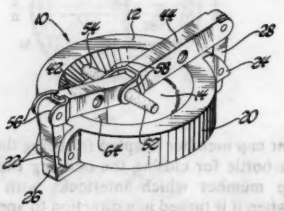
FILL PIPE COVER

Lowell F. Nelson, Muskegon, Mich., assignor to Enterprise Brass Works, Muskegon, Mich.

Filed Nov. 4, 1970, Ser. No. 86,669

Int. Cl. A47j *27/08*

U.S. Cl. 220—55 Z **1 Claim**



A fill pipe cover having a pair of diametrically opposite pivotal cam levers and an overcenter linkage for manual operation of the levers.

3,698,593

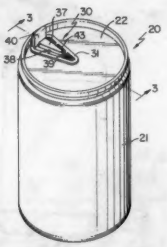
CONTAINER CONSTRUCTION AND CLOSURE PLUG THEREFOR

Daniel S. Cvacho; Patrick A. Fastabend; Alfred L. Garriques, and Eric L. Jensen, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed July 28, 1971, Ser. No. 166,946

Int. Cl. B65d *43/10*

U.S. Cl. 220—60 A **30 Claims**



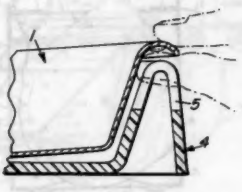
A removable closure plug seals closed an opening passing through a wall of a container construction, the removable closure plug having an annular groove therein snap-fittingly receiving the edge of the opening and engaging against the annular surface of the wall that is disposed intermediate the inner and outer surfaces of the wall whereby the closure plug seals closed such opening. The closure plug is so constructed and arranged that internal pressure in the container construction is adapted to increase to a certain value without adversely effecting the seal of the closure plug thereto. The closure plug is also so constructed and arranged that the same is adapted to vent the internal pressure to the exterior of the container construction intermediate opposed ends of the closure plug when the internal pressure exceeds that certain value by toggling the closure plug intermediate the opposed ends thereof so that the opposed ends remain secured to the container construction whereby the closure plug tends to prevent the internal pressure from exceeding such certain value.

3,698,594

DISPOSABLE FEEDING DISH AND ITS COMPLEMENTARY RECEPTACLE

Marjorie A. Boehlert, 2320 Great Falls Street, Falls Church, Va.

Filed Aug. 20, 1970, Ser. No. 65,428
Int. Cl. B65d 25/16
U.S. Cl. 220—63 2 Claims



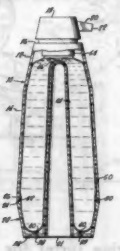
A disposable dish that may be temporarily attached to its complementary receptacle by an adhesive substance which, until useful, is protected by a covering that is easily removable. The disposable dish is fitted into its complementary receptacle and may be removed therefrom, after use, by means of a flipstring or a cut away portion of the receptacle. An alternate way of temporarily fastening the disposable dish to its receptacle is through locking a raised locking ridge circumscribing the outside of the disposable dish under locking tabs complementarily placed in the receptacle. The sides and base of the receptacle may receive the entire dish which may be removed through a cut away in the receptacle or by the flipstring or the upper sides of the receptacle may extend approximately one half way around the receptacle base, in which event the upper lip of the disposable dish or the raised locking ridge is guided through an indented track and an adhesive on the disposable dish locks it into place in the receptacle. The dish is removed from its receptacle by slight manual force.

3,698,595

PRESSURIZED DISPENSER

Norman Gortz, 11151 Coventry Place, Santa Ana, Calif., and Michael B. Maccarone, 17932 Gillman Avenue, Irvine, Calif.

Filed Dec. 22, 1969, Ser. No. 887,189
Int. Cl. B65d 25/14
U.S. Cl. 220—63 R 8 Claims



A resilient bladder-type dispenser wherein the bladder, when empty, is prestressed over a mandril extending into the dispenser. The bladder is provided with a flexible, flat bottom wall which is self-aligning over a tapered mandril. An annular enlarged diameter portion is provided on the bladder near its upper edge for forming a fold to maintain the bladder in fluid tight relationship with a gland which can be mounted in the dispenser to lock the bladder in place. A dispensing valve is provided in the bladder so that when the valve is opened the bladder walls force fluids therefrom. A stop is provided so that when the dispenser cap which actuates the valve is oriented in a certain manner, the valve cannot be inadvertently activated.

3,698,596

NECKED-IN CONTAINER

Vinson S. Potts, Cherry Hill, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Jan. 20, 1970, Ser. No. 4,295
Int. Cl. B65d 7/42
U.S. Cl. 220—67 5 Claims

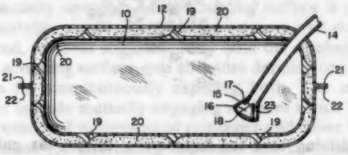
Cans having a tubular body necked-in at one or both ends. The tubular body is side seamed and the ends are seamed to the tubular body.

3,698,597

TANK FOR LIQUID FUEL

William F. Burke, 4825 E. Roosevelt Blvd., Philadelphia, Pa.

Filed Dec. 3, 1970, Ser. No. 94,838
Int. Cl. G05b
U.S. Cl. 220—86 3 Claims



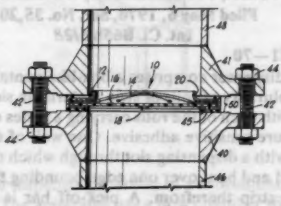
An inner tank for containing liquid fuel; an outer, larger tank spaced from, and wholly enclosing, said inner tank; said tanks co-acting to define a chamber therebetween for receiving a fire-extinguishing, or fire-resisting material; a supply pipe leading into said inner tank, and an automatic valve for closing the inner end of said pipe to prevent outflow of the fuel through said pipe.

3,698,598

SAFETY PRESSURE RELIEF DEVICE

Loren E. Wood, Tulsa, and Marvin H. Free, Owasso, both of Okla., assignors to Black, Sivalls & Bryson, Inc., Tulsa, Okla.

Filed July 26, 1971, Ser. No. 165,915
Int. Cl. F16k 17/16; F17c 13/06
U.S. Cl. 220—89 A 7 Claims



The present invention relates to an improved safety pressure relief device of the rupturable type comprising a rupture member which is of sufficient strength to rupture at a predetermined pressure having a concave-convex portion

connected to an annular flat flange portion, a circular resilient sealing member positioned adjacent to and facing the concave side of said rupture member, the peripheral portion of said sealing member coinciding with the annular flat flange portion of said rupture member, and a flat circular support member positioned adjacent to the sealing member, the support member having slots radiating outwardly from a central portion and terminating short of the outer periphery thereof forming a plurality of sector shaped portions connected together at the central portion so that the support member provides support for the sealing member but readily ruptures and opens upon rupture of the rupture and sealing members. The outer peripheral edge of the support member is folded over the outer peripheral edges of the sealing and rupture members so that the members are rigidly held together.

3,698,599

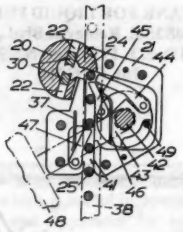
FEED TO DRIVING TOOL HAVING BAND HELD SCREWS

Gustaf Harry Fernstrom, Klinten, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Division of Ser. No. 838,515, July 2, 1969, Pat. No. 3,601,168. This application Feb. 19, 1971, Ser. No. 116,852

Int. Cl. B65h 5/28

U.S. Cl. 221—25 **5 Claims**



In a driving tool for fasteners a driver has guide jaws releasably clamped thereagainst for holding a fastener in frontal alignment therewith. During driving movement of the driver together with said fastener towards a work piece, the guide jaws, in response to said fastener striking against the work piece, are arrested in spaced relation to the work piece and knocked loose from the driver for releasing the fastener from the guide jaws while the driver continues its driving movement. The driving tool may be provided with a magazine for band supported fasteners, which by an ejector are forced to break out laterally one by one from the band in between the guide jaws and by a feeder are moved together with the band one after the other to the ejector, said ejector and feeder being pivotally supported on a rocker member such as to alternately actuate the fasteners as the arm is rocked alternately in one direction and the other.

3,698,600

LABEL DISPENSER

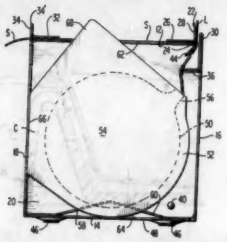
Richard W. Foote, 144 Chestnut St., Willimantic, Conn.

Filed May 6, 1970, Ser. No. 35,206

Int. Cl. B65h 5/28

U.S. Cl. 221—70 **10 Claims**

A label dispenser comprises a box-like container adapted to receive a plurality of rolls of strip material in side-by-side relation and with each of the rolls carrying a series of labels coated with pressure sensitive adhesive. One wall of the container is provided with a dispensing slot through which the strip material is passed and bent over one edge bounding the slot to cause a label to strip therefrom. A pick-off bar is spaced slightly from said one wall substantially perpendicular thereto and generally in the same plane of said one edge. The other edge bounding said slot comprises a lip extending beyond the plane of said one wall in spaced relation to and substantially parallel with said pick-off bar. A guide member extends longitudinally within said container beneath said slot to guide the strip material through a sharp bend as it passes through said slot to cause the labels to strip therefrom, said labels being directed outwardly by said lip to lodge lightly on said pick-off bar as said strip material is withdrawn from the container. Said one wall and the wall opposite thereto are provided with a series of



aligned slots extending perpendicular to said dispensing slot and said rolls of strip material are enclosed within cartridges, each comprising a flat container having peripheral flange portions which are removably fitted in an aligned pair of slots with the flange portions extending through said one wall and defining guides for the strip material after it has passed through said dispensing slot.

3,698,601

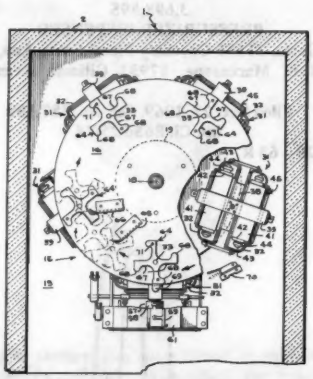
MAGAZINE FOR DISPENSING MACHINE

Raymond H. Sierk, White Stone, N.Y., and Raymond W. Sierk, Kinnelon, N.J., assignors to Atomatic Swank Frank Corp., New York, N.Y.

Filed July 22, 1971, Ser. No. 165,190

Int. Cl. B65h 3/40

U.S. Cl. 221—105 **12 Claims**

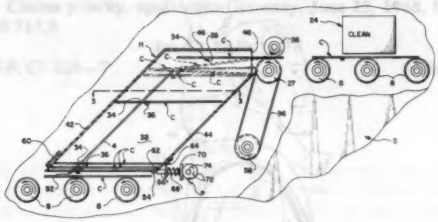


A multiple magazine turret for packaged articles to be dispensed, which is rotatable step by step to bring each magazine to a dispensing position. Each magazine includes parallel racks arranged back to back upon a pivot shaft with means to releasably hold the racks in predetermined positions. Cams are placed to cause rotation of the magazines about their pivot shafts as the turret moves step by step to move empty racks out of dispensing position and replace them with full ones. After two revolutions of the turret and depletion of all racks, the operation is stopped automatically. Each rack is tiltable from its dispensing position for loading, and the individual racks are removable from the turret and the turret is removable as a whole from a dispensing cabinet in which it is operative.

3,698,602
GRAVITY-FED STORAGE DEVICE

Oliver W. Gnage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 6, 1970, Ser. No. 52,152
Int. Cl. B65h 5/00
U.S. Cl. 221—225 6 Claims

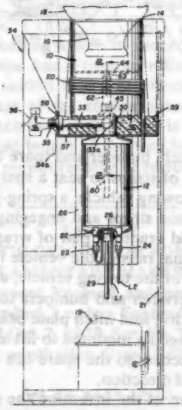


A storage device is provided in an electrophotographic apparatus which includes a storage chamber for storing and dispensing photoconductive elements or chips seriatim wherein the chips are fed from an upper receiving end of the storage compartment to a lower dispensing end thereof by gravity and are held in a substantially horizontal position as they travel from the upper chip receiving end to the lower chip dispensing end to reduce jamming. The chips are fed into the storage chamber by a pair of offset pressure rollers which hold the chips substantially horizontal until its forward end extends over a pair of guide rails attached to the side of the storage compartment so that notches in the photoconductive elements engage the rails. The storage compartment takes the form of a parallelepiped having offset upper and lower ends with sloping side walls so that the chips slide downwardly and forwardly on a cushion of air formed between the chips. The lowermost chip is fed from the storage chamber by a pusher mechanism which causes the chips to be moved forwardly off of supporting feet. A spring detent deflects the chip downwardly onto transport rollers which advance the chips through the electrophotographic apparatus.

3,698,603
WATER-DISTRIBUTING SYSTEM FOR A HOT AND COLD DRINKING WATER DISPENSER

Richard J. Radcliffe, Gahanna, Ohio, assignor to Ebco Manufacturing Company, Columbus, Ohio

Filed July 9, 1971, Ser. No. 161,052
Int. Cl. B67d 5/62
U.S. Cl. 222—146 R 6 Claims

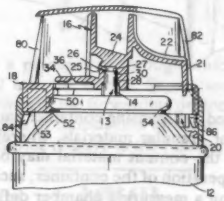


An inverted bottle-type drinking water dispenser having a pair of vertically spaced, water cooling and heating receptacles joined by a readily demountable water-distributing manifold having passages therein connecting the receptacles with a pair of externally accessible faucet valves. A central conduit interconnects the water-cooling and heating receptacles and is provided with baffle means to minimize water turbulence and thermosyphoning between the heating and cooling receptacles.

3,698,604
DISPENSING CONTROL STRUCTURE FOR PRESSURIZED DISPENSING PACKAGE

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 2, 1969, Ser. No. 863,093
Int. Cl. B65d 83/14
U.S. Cl. 222—182 11 Claims

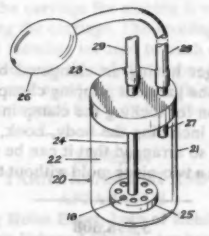


A pressurized dispensing package in which a container having a material discharge valve including a discharge aperture and a manually operable valve actuating surface is provided with a rotatable cover which has one or more wall structures, as required, to cover simultaneously both the discharge aperture and actuating surface, and structure defining one or more apertures for simultaneously exposing both. The container and cover include mutually engaging surfaces which limit the relative rotational movement of container and cover between two positions for alternating exposure and covering of the aperture and actuating surface for periods of use and non-use respectively, by rotating the cover in reverse directions. The mutually engaging surfaces are constructed to have portions co-circumferential of each other which abut one another during engagement.

3,698,605
DISCOVERY IN SOLUTION DISPENSERS

Sverre Quisling, 1240 Sherman Avenue, Madison, Wis.

Filed March 26, 1971, Ser. No. 128,346
Int. Cl. B01f 1/00
U.S. Cl. 222—190 4 Claims



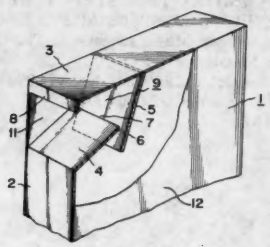
Apparatus for dispensing solution of a substantially uniform concentration. The apparatus has a flow chamber with an inlet and an outlet. A liquid solvent is admitted to the flow chamber and washes over a soluble substance which is bonded to an insoluble carrier member restrained within the flow chamber for forming a solution to be dispensed.

3,698,606

CONTAINER HAVING QUANTITATIVE MEASURING CHAMBER FOR GRANULAR MATERIAL OR THE LIKE

Katsuhiko Wakamatsu, 5-go, 10-ban, 2-chome, Momoi, Suginami-ku, Tokyo-to, Japan

Filed Oct. 21, 1969, Ser. No. 868,075
Claims priority, application Japan, Oct. 29, 1968, 43/78642
Int. Cl. G01f *11/26*
U.S. Cl. 222—454 7 Claims



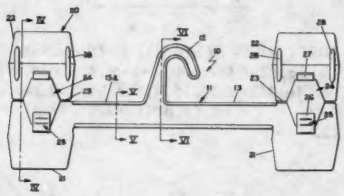
There is described a dispensing container particularly suitable for powdery or granular materials, whereby a predetermined amount of the content material may be dispensed at every one tilting operation of the container, such container essentially comprising a measuring chamber defined by an end of a slant wall adapted to flow the content material to said chamber, a part of an external wall of the container and a slant intercepting wall having a predetermined angle with respect to said external wall, with a space being formed between said end of the slant wall and said slant intercepting wall to provide an inlet for the content material to be introduced into said measuring chamber.

3,698,607

GARMENT CLAMPING HANGER

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed March 10, 1970, Ser. No. 18,130
Int. Cl. A47j *51/14*
U.S. Cl. 223—96 10 Claims



A garment hanger having an elongated body member, a hook and at least one garment gripping clamp and a latch and keeper combination for locking the clamp in closed position. The entire hanger including the body, hook, clamps, latches and keepers being so arranged that it can be molded as a single, integral part in a two-piece mold without the use of cams.

3,698,608

SHOULDER SADDLE ASSEMBLY

Clive E. Entwistle, 44 East 67th Street, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,414
Int. Cl. A47d *13/02*
U.S. Cl. 224—6 6 Claims

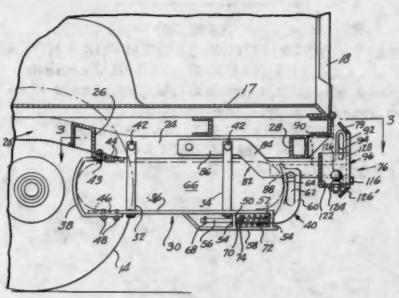
A shoulder saddle assembly which may be worn by an adult to support and carry a child or injured adult with minimal effort and without the need for the bearer to hold the feet of the passenger or for the passenger to grip the head of the bearer. The assembly is constituted by a yoke member fitting over the head of the bearer and adapted to rest on the shoulders of the bearer, the yoke including a breast plate and a back plate to afford an effective distribution of the load. Removably secured to the yoke member is a cowl-shaped saddle piece, having a curved rear wall to receive the posterior of the passenger and rolled-in side walls to accommodate the passenger's thighs.

3,698,609

COMBINATION HITCH BUMPER AND SPARE TIRE CARRIER

Clifford C. Lund, Box 384, Moroni, Utah

Continuation-in-part of Ser. No. 819,396, April 25, 1969, abandoned. This application April 5, 1971, Ser. No. 131,360
Int. Cl. B62d *43/00*
U.S. Cl. 224—42.05 12 Claims



A combination hitch, bumper and spare tire carrier including a cradle formed of straps to seat a spare tire horizontally below the bed of a towing vehicle, a spring-pressed tire clamp secured to one of said straps and engaging the spare tire to hold the same in said cradle, a pair of wrap-around bumpers secured to longitudinal rails of the vehicle frame and protecting the rear corners of the towing vehicle, a hitch plate joined to and extending between said bumpers to hide and prevent access to the spare tire, said hitch plate being releasable from the bumpers and hingedly mounted to lift and turn to a raised position providing access to the spare tire for ready removal thereof in a rearward direction.

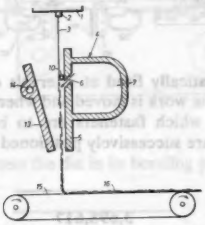
In a modified form of the invention the spring-pressed tire clamp is omitted and the tire is retained in place by the hitch plate.

3,698,610

PROCESS AND DEVICE FOR THE MANUFACTURE OF A NON-WOVEN MATTED WEB FROM SYNTHETIC YARN

Karl-Heinz Feltgen, Dormagen, and Gunther Espanion, Cologne, Mauenheim, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 17, 1969, Ser. No. 833,934
Claims priority, application Germany, June 22, 1968, P 17 60 713.5
Int. Cl. B65h 51/16
U.S. Cl. 226—7 8 Claims



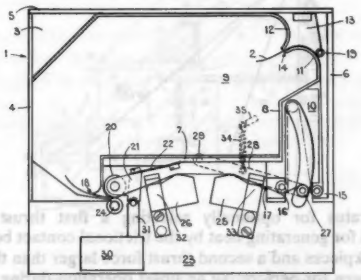
A process and apparatus for the manufacture of a non-woven matted web from synthetic yarn is provided wherein a set of doffed filaments is deflected through an angle of about 15° to 40° by a supersonic jet.

3,698,611

WEB FEEDING APPARATUS

Kenneth Frederick C. Twine, Uxbridge, England, assignor to International Computers Limited, Putney, London, England

Filed Nov. 4, 1970, Ser. No. 86,869
Claims priority, application Great Britain, Nov. 6, 1969, 54,402/69
Int. Cl. B65h 17/42
U.S. Cl. 226—50 2 Claims



Apparatus for feeding a web of recorded medium such as plastic or paper tape has a capstan roller for feeding a web past a read/write station in a first direction and a device is positioned upstream of the station automatically to form a loop in the web when the capstan roller is disengaged from the web to move a fixed length of the web in a reverse direction past the station to permit reading or re-recording of the information on the web.

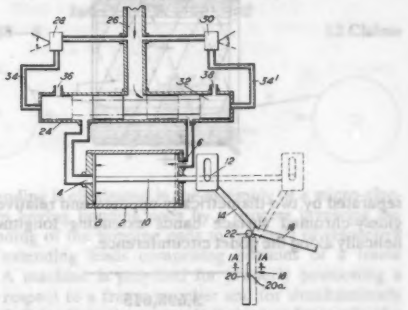
3,698,612

PNEUMATIC DEVICE FOR FORWARDING FILAMENTARY MATERIAL

James Brock, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 2, 1970, Ser. No. 77,408
Claims priority, application Great Britain, Oct. 10, 1969, 49,831/69
Int. Cl. B65h 17/32
U.S. Cl. 226—91 8 Claims

A pneumatic forwarding device suitable for automatic string-up with a running band of material, especially in processes in which the pneumatic forwarding device is reciprocatably traversed, comprises two hinged sections which normally firmly abut with each other, the plane of their abutment intersecting with the internal passageway through which a band of continuous material is forwarded, but not intersecting with a passageway through which the forwarding fluid is induced into the device. Separation and close abutment of the sections of the forwarding devices is effected automatically by means of transducers which sense the position of the forwarding device relative to the running band of material.

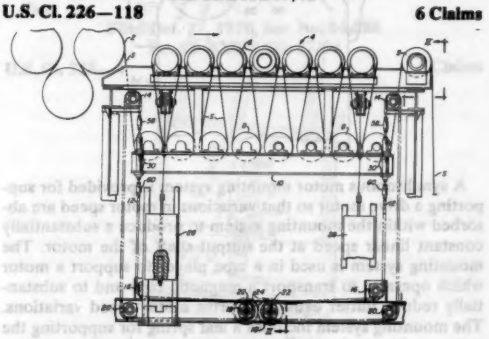


3,698,613

STRIP ACCUMULATOR

Howard W. Gordon, and James N. Shepard, both of Concord, Calif., assignors to United States Steel Corporation

Filed Jan. 15, 1971, Ser. No. 106,831
Int. Cl. B65h 17/42
U.S. Cl. 226—118 6 Claims



A strip accumulator including fixed rolls, a vertically movable carriage with a plurality of rolls thereon, the strip passing alternately around the fixed and carriage rolls, and a chain at each corner of the carriage for moving it vertically has novel means for leveling the carriage. The leveling means includes a female threaded member secured to each corner of the carriage, an elongated male threaded member threaded into each female member, and a rod movable with each male member having its ends connected to the ends of the associated chain.

3,698,614

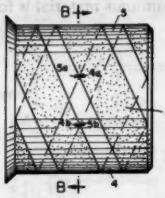
GODET FOR YARN TRANSPORT AND STRETCHING APPARATUS

Bernhard Mohr; Heinz Engel, both of Kelsterbach, Germany, and James Watt Ijsbrand Heijnis, Arnhem, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed May 15, 1970, Ser. No. 37,824
Claims priority, application Germany, May 17, 1969, P 19 25 210.9; Feb. 12, 1970, P 20 06 235.5
Int. Cl. B65h 17/20
U.S. Cl. 226—193 5 Claims

A rotatable godet in apparatus for stretching and transporting yarn, thread or similar filamentary materials, said godet

having a cylindrical yarn contacting surface in which relatively large matte-chromed or roughened surface portions are



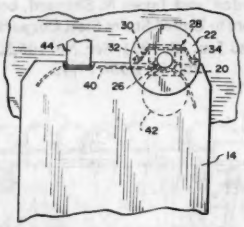
separated by two diametrically opposed and relatively narrow glossy-chromed surface bands extending longitudinally or helically along the godet circumference.

3,698,615

SYNCHRONOUS MOTOR MOUNTING SYSTEM FOR SPEED CONTROL

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 1, 1971, Ser. No. 111,573
Int. Cl. B65h *17/20*
U.S. Cl. 226—194 **5 Claims**



A synchronous motor mounting system is provided for supporting a drive motor so that variations in motor speed are absorbed within the mounting system to produce a substantially constant linear speed at the output shaft of the motor. The mounting system is used in a tape player to support a motor which operates to transport a magnetic tape and to substantially reduce flutter caused by drive motor speed variations. The mounting system includes a leaf spring for supporting the motor and is mechanically tuned to a resonant frequency that will minimize flutter. The motor is a slow speed motor and can be used for direct drive of the capstan shaft of the tape player without interposing gear reducing means or pulleys between the capstan shaft and motor.

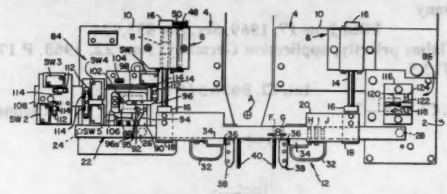
3,698,616

GAGING MECHANISM FOR FASTENER ATTACHING MACHINE

William A. Erhardt, Jr., South Weymouth, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed June 23, 1971, Ser. No. 155,756
Int. Cl. A41h *37/04*
U.S. Cl. 227—3 **7 Claims**

In combination with a snap fastener attaching machine, there is an improved gaging mechanism for holding the work and transporting the work to selected positions relative to the fastener setting tools for the attachment of a plurality of fastener components in a spaced, predetermined pattern. The work transporting portion of the gage carries a key movable therewith through a keyway on a fixed section of the gage and the keyway defines a network through which the key travels to establish the spacing and pattern of the fastener components. A plurality of spaced switches which control the operation of the fastener setting tools are mounted on the gage proximate the keyway and the said switches are adapted to be sequentially, momentarily closed by the key and a switch actuator on the work moving portion on the gage as the key travels through the keyway network, whereby the fastener setting



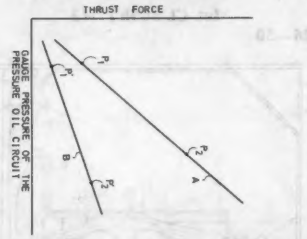
tools are automatically fired at intervals determined by the speed at which the work is moved and when the selected areas of the work to which fasteners are to be attached in the desired pattern are successively positioned at the interface of the setting tools.

3,698,617

APPARATUS FOR OPTIONALLY SELECTING THRUST FORCE APPLIED TO THE WORKPIECES IN THE FRICTION WELDING

Shigeo Fukaya, 38-1, Miyoshicho Duza Myochiazu Fukanhazama, Nishikamo-gun, Aichi-ken, and Nobuo Takagi, 50-36, Daza Ogahieaza Kamisawawatari, Kariya-shi, Aichi-ken, both of Japan

Filed Feb. 10, 1969, Ser. No. 797,772
Claims priority, application Japan, Feb. 10, 1968, 43/8492
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **9 Claims**



Apparatus for optionally selecting a first thrust force required for generating heat by the frictional contact between two workpieces and a second thrust force larger than the first thrust force for performing an upset operation during a friction welding operation. Two series of thrust force generating systems are selectively combined to actuate a hydraulic cylinder of the friction welder. In a typical embodiment, one thrust force generating system is used for generating the thrust force required for performing the upset operation while the other thrust force generating system is used for generating the thrust force required for generating heat. The above-mentioned combination of thrust forces is optionally selected by a fluid circuit comprising a plurality of electromagnet valves, pressure reducing valves and their connections.

3,698,618

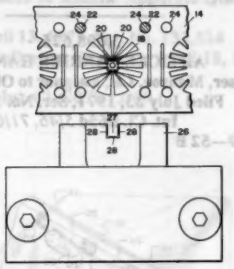
FACE BONDING MACHINE

Robert W. Helda, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 798,657, Feb. 12, 1969, abandoned.
This application Nov. 29, 1971, Ser. No. 203,007
Int. Cl. B23k *21/00*; B23p *3/02*
U.S. Cl. 228—3 **7 Claims**

This disclosure discloses a method of bonding and a face bonding machine adapted to bond an integrated circuit die

having a plurality of electrodes thereon to a substrate having a plurality of leads. The machine has a receptacle which



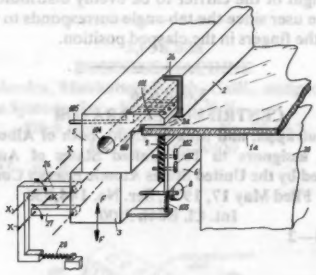
mechanically registers the die in its bonding position on top of the substrate leads.

3,698,619

DEVICE FOR THE MANUFACTURE OF AN INSULATING PANE UNIT

Michel Jacquot, Beynes, and Charles Amicel, Carrieres, Seine, both of France, assignors to Boussois Souchon Neuvesel, Paris, France

Filed July 6, 1970, Ser. No. 52,525
Claims priority, application France, July 24, 1969, 6925254
Int. Cl. B23k *1/00, 5/00*
U.S. Cl. 228—6 **14 Claims**



A method for forming a soldered joint between one flange of a sectional lead strip and the edge of a glass plate which has previously been metallized with tin, especially for the manufacture of an insulating pane unit formed by two glass panes separated by an intercalary U-section strip. The flange of the sectional strip is applied against the glass pane under controlled pressure, the contacting surfaces are maintained at a sufficiently high temperature to melt the tin without impairing the crystal structure of the lead and the soldered joint is then allowed to cool while the pressure is maintained until the tin has set.

The device for carrying out the method comprises a stationary table along the edge of which is mounted a heating jaw for clamping one of the panes of the double pane unit together with the adjacent flange of the sectional strip. The jaw is provided on the one hand with a heating lip and on the other hand with a plate clamp, means being additionally provided for adjusting the relative spacing of the flange and of the plate clamp.

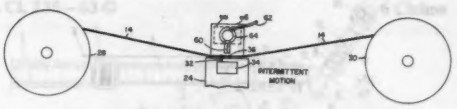
The method and device aforesaid are intended to increase the speed and regularity of production and to permit of automatic operation.

3,698,620

APPARATUS FOR CONNECTING LEAD PORTIONS OF A LEAD FRAME TO RESPECTIVE PADS ON A CHIP

Harry J. Geyer, Phoenix, Ariz., and Robert W. Helda, Hollywood, Fla., assignors to Motorola, Inc., Franklin Park, Ill.

Filed March 25, 1970, Ser. No. 22,445
Int. Cl. B23k *1/00, 5/00*
U.S. Cl. 228—6 **12 Claims**



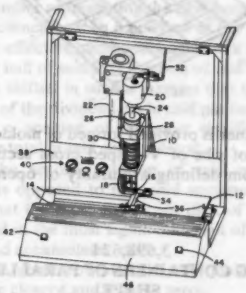
Wire bonding is eliminated in the assembly of a micro-electronic chip having bonding pads by a process involving the direct bonding of the bonding pads to the ends of respective inwardly extending leads comprising portions of a frame member. A machine is provided for properly positioning a chip with respect to a frame member and for simultaneously bonding of all leads to the ends of all the bonding pads of a semiconductor integrated circuit chip in one step. Many frame members are provided in a strip which may be supplied rolled up on a reel. After the pads on the chip are bonded to the ends of the leads of the frame member, the strip may be rolled on another reel and transported to another machine for performing another step or other steps thereon.

3,698,621

BONDING APPARATUS

Jack J. Burke, Richardson, and Joseph M. Guillot, Jr., Plano, both of Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed Oct. 27, 1970, Ser. No. 84,288
Int. Cl. B23k *1/00, 37/04*
U.S. Cl. 228—4 **6 Claims**



Apparatus for automatically thermo-compression bonding of leads to microelectronic circuits thereby obviating wire bonding. Horizontally movable table means is provided beneath vertically movable bonding means with indexing means provided to automatically and sequentially move a plurality of circuits and lead frames on the table into position for bonding.

3,698,622

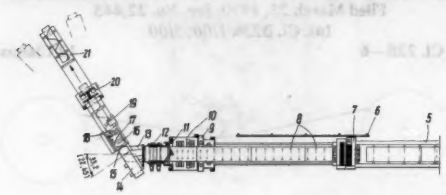
METHOD AND DEVICE FOR SUPPLYING A BAND MADE OF SHEET METAL PLATES TO A SPIRAL WELDED TUBE MILL

Heinz Krakow, and Carl Niedorf, both of Hamburg, Germany, assignors to Blohm & Voss AG, Hamburg-Steinwerder, Germany

Filed April 6, 1971, Ser. No. 131,737
Int. Cl. B23k *1/20*
U.S. Cl. 228—5 **5 Claims**

The method and device of the invention provide for supplying sheet metal plates of substantial thickness to the deforma-

tion device of a spiral welded tube mill and comprises the intermittent feeding of individual sheet metal plates to a prefabrication device which is arranged ahead of a conventional spiral weld tube mill. In this prefabrication device, the individual sheet metal plates are first welded together to form



double length plates which then are connected by welding to a previously completed band comprising serially connected double length sheet metal plates whose longitudinal edges are trimmed and chamfered before being conveyed into the deformation device which forms the band into a tube and unites the abutting longitudinal edges to form a spiral weld.

3,698,623

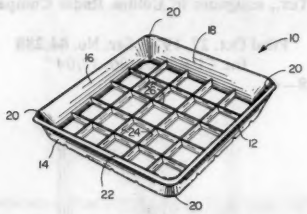
OPEN BOTTOM MEAT CONTAINER

Kenneth D. Bixler, Huntington, N.Y., assignor to Diamond International Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,545

Int. Cl. B65d *1/34*

U.S. Cl. 229—2.5 **6 Claims**



A meat container is provided formed of molded pulp which has a plurality of ribs of V-shaped cross section extending across the bottom defining a plurality of open bottom windows.

3,698,624

PACKAGING CONTAINERS OF PARALLELEPIPED SHAPE

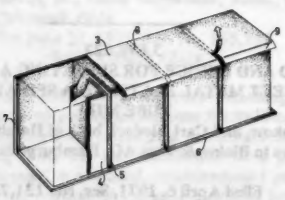
Sven Olof Soren Stark, Sodra Sandby, Sweden, assignor to Cordotex SA, Lausanne, Switzerland

Filed June 3, 1970, Ser. No. 43,119

Claims priority, application Sweden, Aug. 13, 1969, 11242/69

Int. Cl. B65d *13/04*

U.S. Cl. 229—23 R **11 Claims**



A packaging container in which an element having at least one channel-shaped portion is enclosed by a channel-shaped member thus forming one or a connected series of parallelepiped shaped containers; the edges of the element being sealed to the member. A series of containers may be separated from each other and each container may have means for facilitating the opening thereof.

3,698,625

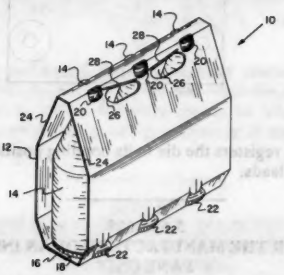
ARTICLE CARRIER HANDLE

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc.

Filed July 23, 1971, Ser. No. 165,541

Int. Cl. B65d *5/46, 71/00*

U.S. Cl. 229—52 B **4 Claims**



An improved carrying handle for an article carrier of the type having an opening in the upper portion thereof whereby the user inserts his fingers in the opening of the carrier in order to transport the carrier. The carrier handle comprises a pair of inclined openings which are so designed that the tab formed from the opening bridges the gap from one side of the carrier to the other side to cushion the fingers of the user against the weight of the article. The angle of the tabs also allows the weight of the carrier to be evenly distributed on the fingers of the user since the tab angle corresponds to the natural angle of the fingers in the clasped position.

3,698,626

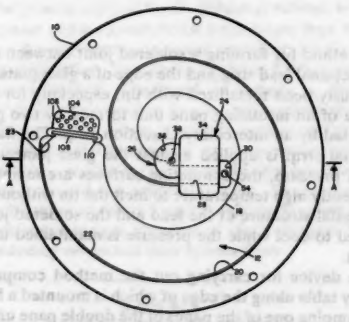
CENTRIFUGE SEPARATOR

Payasada Kotrappa, and Max E. Light, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 17, 1971, Ser. No. 144,036

Int. Cl. B04b *3/00*

U.S. Cl. 233—2 **7 Claims**



A centrifuge separator with spiral channel of expanding width from the center of the spiral, to receive material to be separated at the center of the spiral, and with means for laminarly flowing a stream of gas through the channel to carry the material therethrough and for collecting separated materials at different locations along the outer wall of the channel.

3,698,627

TAXIMETER ARRANGEMENT WITH EXCHANGEABLE CONTROL UNIT

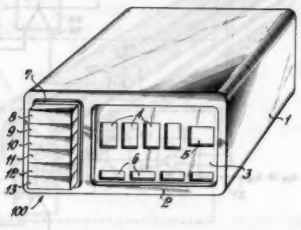
Heinz Keich, Buchenberg, and Eduard Schuh, Villingen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed April 13, 1971, Ser. No. 133,514

Claims priority, application Germany, April 18, 1970, P 20 28 640.7

Int. Cl. G07b *13/00*

U.S. Cl. 235—30 R 18 Claims



A taximeter apparatus, including distance and time measuring devices, a calculator, and an indicator, is mounted in a housing into which any one of several control units can be selectively inserted. Each control unit has plugs which engage sockets in the housing when the control unit is inserted and operative. Each control unit has different manual operating means for selecting functions of the taximeter apparatus, such as calculating different charges in accordance with different rates.

3,698,628

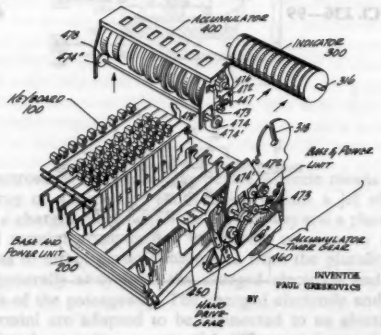
BUSINESS MACHINE

Paul Greskovics, Manhattan Beach, Calif., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,063

Int. Cl. G06c *29/00*

U.S. Cl. 235—60 R 8 Claims



A cash register is provided with an accumulator and a display. On ADD cycles of the cash register, the accumulator is moved in one direction to engage the digit tape by a pair of eccentrics, and on TOTAL cycles, it is moved in another direction by another eccentric to transfer digital information to the display. Control of the eccentrics is provided by an axially movable timing gear which provides a modified geneva-type mechanical movement.

3,698,629

MECHANICAL CALCULATING APPARATUS FOR ADDING, SUBTRACTING, MULTIPLYING AND DIVIDING

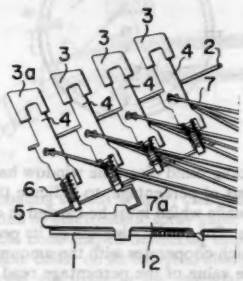
Thomas K. McGourty, Aptos, Calif., assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 19, 1969, Ser. No. 851,182

Claims priority, application Japan, Aug. 20, 1968, 43/59480

Int. Cl. G06c *23/00*, *11/04*, *19/04*

U.S. Cl. 235—63 G 6 Claims



A calculating machine for executing addition, subtraction, multiplication and division wherein a number set into the machine is printed as an effective number in accordance with the decimal orders of the calculating machine for visual observation in addition or subtraction characterized by the provision of a dividend introduction mechanism and by that after setting a dividend in a pin box and depressing a division () key:

1. a type bar is moved upwardly in the first half rotation of the first rotation of a main shaft without transferring the dividend to an accumulator so that the dividend is printed in such a manner that the least significant digit of the effective number representing the first decimal order of the dividend coincides with a position of the least significant digit of an effective number in addition or subtraction;
2. in the last half of said first rotation of said main shaft, said pin box is shifted in such a manner that the most significant digit of the dividend set in said pin box may be transferred to a position of the most significant digit of a number or total in said accumulator;
3. during the second rotation of said main shaft, the dividend is opposed to into said accumulator in such a manner that the most significant digit of the dividend is transferred in the most significant digit of the number or total in said accumulator; and
4. during the second rotation of said main shaft, caution pinions are cleared and reset to zeros.

3,698,630

INSURANCE CALCULATOR

George W. Dick, Stamford, Conn., and Norman Diamond, Laurelton, N.Y., assignors to Metropolitan Life Insurance Co., New York, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,828

Int. Cl. G06g *1/08*

U.S. Cl. 235—78 4 Claims

The calculator comprises a circular background disc having a logarithmic premium scale, and a foreground disc rotatable on the background disc and having a logarithmic amount of insurance scale adapted to cooperate with the premium scale. The background disc also has one or more concentric linear age scales observable through windows in the foreground disc. The foreground disc carries index lines cooperating with the age scales. Each age scale corresponds to a different plan of insurance. A sector shaped cursor is pivotally connected to the center of the background and foreground discs and is provided on its periphery with a period of time scale which cooperates with the premium scale to indicate the amount of

premium required for selected time periods.

For more complex combinations of types of insurance, which consist essentially of a first amount of one type of insurance and a second amount of another type, with their corresponding premiums, the background scale is provided with a family of non-radial age curves which are viewable through a

window on the foreground disc. The window has a radial line calibrated in terms of percentage, to indicate the percentage of the total insurance which must be carried in one particular type of insurance. The cursor also has on its periphery a percentage scale which cooperates with the amount of insurance scale to show the value of the percentage read off the radial line.

3,698,631

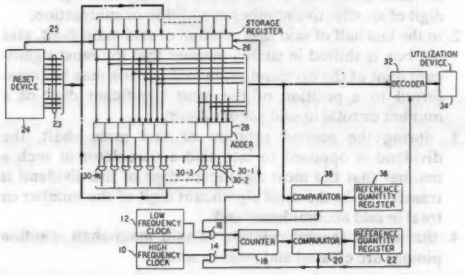
APPARATUS FOR GENERATING A LOGARITHMICALLY RELATED SERIES OF DIGITALLY CODED SIGNAL QUANTITIES

Rudolph Charles Drechsler, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 19, 1970, Ser. No. 91,113

Int. Cl. G06f *15/34, 7/385*

U.S. Cl. 235—152 **14 Claims**



By repeated application of the contents of an accumulator to an adder at both full and reduced numerical significance and reapplication of the output sum of the adder to the accumulator, the representative numerical signal stored in the accumulator is made to rise exponentially. This process is periodically interrupted to permit use of the logarithmically related digitally coded signal quantities stored in the accumulator to drive any digitally programmable utilization device.

3,698,632

FLUIDIC ADDER-SUBTRACTER UTILIZING THRESHOLD LOGIC

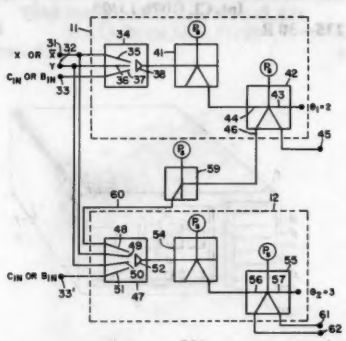
Herbert M. Eckerlin, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,469

Int. Cl. G06m *1/00*

U.S. Cl. 235—201 PF **7 Claims**

A fluidic adder-subtracter stage utilizing the principles of threshold logic. This circuit consists of two fluidic threshold gates, a first having three inputs and a second having four inputs. The two bits from the given order and the carry bit or the borrow bit from the previous order are coupled to the three first gate inputs and three of the second gate inputs. An output from the first gate is coupled to the fourth input of the second



gate. When the stage is utilized as an adder the first gate provides a carry out signal and the second gate provides a sum signal. When it is used as a subtracter, the first gate provides a borrow out signal and the second gate provides a difference signal.

3,698,633

THERMAL CONTROL ELEMENT

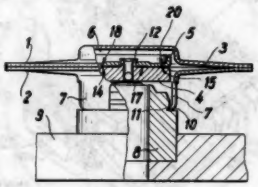
Josef Lingnau, Bremen-Borgfeld, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co., Bremen, Germany

Filed Aug. 2, 1971, Ser. No. 168,262

Claims priority, application Germany, Aug. 1, 1970, P 20 38 344.2

Int. Cl. G05d *23/12*

U.S. Cl. 236—99 **4 Claims**



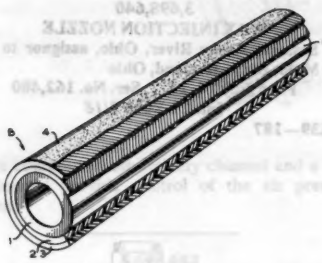
A thermal control element having a stroke membrane, a shutoff means, and a counter plate. The stroke membrane is welded to the shutoff means while the counter plate is connected to the shutoff means by rivet means. Corresponding clamping faces are provided on the shutoff means and the counter plate for clamping unwelded portions of the stroke membrane therebetween.

3,698,634

INSULATED RAIL JOINTS

William R. Hamilton, Jr., Naperville, Ill., assignor to Portec, Inc., Chicago, Ill.

Filed Oct. 2, 1968, Ser. No. 764,563
Int. Cl. E01b *11/54*
U.S. Cl. 238—152 11 Claims



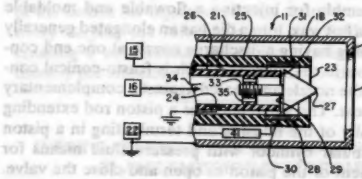
A rail joint including insulated bushings for the joint bolts comprising a metal core having a first layer of a dielectric strengthening composition bonded thereupon and an outer bonded layer of a cold flowable dielectric composition.

3,698,635

SPRAY CHARGING DEVICE

James E. Sickles, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed Feb. 22, 1971, Ser. No. 117,494
Int. Cl. B05b *5/02*
U.S. Cl. 239—3 15 Claims



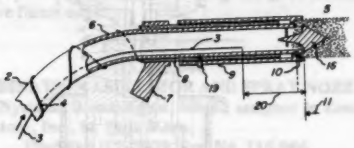
An electrostatic spray charging device wherein means in a passageway or a barrel of such device directs a jet of air between a charged electrode in the passageway and a plurality of liquid termini at an orifice within the passageway in a manner as to direct particles atomized from the plurality of termini generally away from the charged electrode and the side walls of the passageway. The charged electrode and the liquid termini are adapted to be connected to an electrical source thereby creating a potential difference between the charged electrode and the liquid termini. The potential difference therebetween provides a high intensity electric field at the liquid termini whereby particles atomized from the individual liquid termini carry a high charge-to-mass ratio. Preferably, the jet of air passing between the charged electrode and the liquid termini assists in atomizing liquid particles from the liquid termini. The charged liquid particles are attracted to and deposited upon the surface of an object or article at a particle attracting potential.

3,698,636

DEVICE FOR THE ELECTROSTATIC APPLICATION OF PROTECTIVE COATINGS WITH SYNTHETIC POWDERS BY THE USE OF SPRAY GUNS

Imre Szasz, St. Gallen, Switzerland, assignor to Graco Inc., Minneapolis, Minn.

Filed April 23, 1971, Ser. No. 136,900
Claims priority, application Germany, May 6, 1970, P 20 22 088.6
Int. Cl. B05b *5/00*
U.S. Cl. 239—15 10 Claims



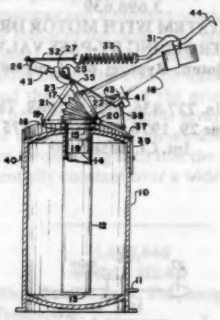
A material coating system to apply charged materials to objects to be coated by electrostatic spray guns. The spray gun itself has a double cone-shaped deflecting member in its barrel and an adjustable collar on its barrel to change the spray pattern. An internal electrode in the material conveying tube charges the material and a wound wire ground connection attached to the gun prevents an accumulation of charge at the gun. A material storage bin with multiple venturis feeds material to the gun by suction via its conveying tube. In addition, a polarity reversing circuit allows the power source to apply different charges to sprayed materials.

3,698,637

SPRAY DEVICE FOR IRRIGATION PURPOSES

Floyd W. McCullough, 4325 North Delno, Fresno, Calif.

Filed June 21, 1971, Ser. No. 154,910
Int. Cl. A01g *27/00*
U.S. Cl. 239—68 10 Claims



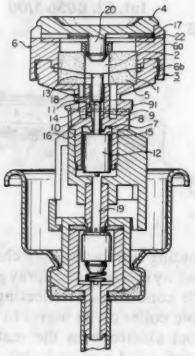
A spray device which can cover a wide variety of sized and shaped areas, and which can be easily adjusted to cover a desired area. In operation, the device stores inflowing water under pressure, and energy in the form of compressed air, in a pneumatic pressure tank and intermittently discharges the water through a nozzle at rates greater than the inflow rate. With each discharge cycle, the nozzle is automatically rotated to point in a slightly different direction and adjusted for pressure at which discharge begins, and for quantity discharged, so that the spray pattern will extend to desired boundaries. Features are incorporated which provide uniform coverage as the nozzle rotates, with progressive discharges. From a given supply source and conduit, a larger nozzle can be used, (and a larger area sprayed) than with conventional spray devices. The device is not subject to clogging from debris in the supply source and will operate satisfactorily on varying source pressure and/or throttled inflow conditions.

3,698,638

DEVICE FOR AUTOMATICALLY AND PERIODICALLY SPRAYING A PRESSURIZED LIQUID

Taisho Iketani, 4-14-6 Nogata, Nakano-ku, Tokyo, Japan

Filed June 11, 1971, Ser. No. 152,236
Int. Cl. B05b *1/28*
U.S. Cl. 239—75 **4 Claims**



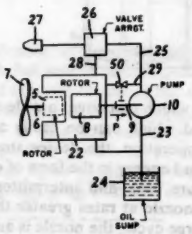
An improved device for automatically and periodically spraying a pressurized liquid comprises a spray nozzle connected to a liquid source through valve means, a heat-responsive bimetal disc for periodically actuating spraying mechanism and means for defining a chamber for containing the bimetal disc, which defining means for bimetal disc chamber is provided with a path for conducing water condensed on the outside surface of the defining means to a front portion of the spray nozzle, whereby the condensed water is blown off together with the pressurized liquid sprayed through the nozzle.

3,698,639

OIL BURNER SYSTEM WITH MOTOR DRIVEN PUMP CONTROLLING BY-PASS VALVE

Kyrre Guttorm Sjotun, Rypevej 62, Langeso pr. Nordborg, Denmark

Division of Ser. No. 727,836, May 9, 1968. This application June 29, 1970, Ser. No. 50,875
Int. Cl. B05b *9/00*
U.S. Cl. 239—124 **1 Claim**



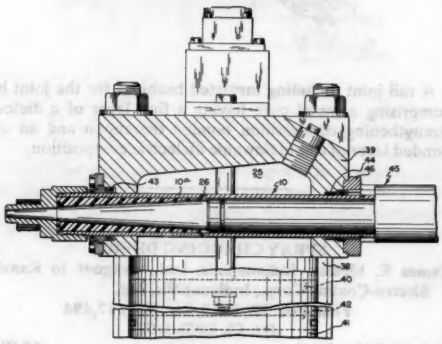
An oil burner system in which a fuel oil pump and the air blower are independently driven by a common motor having a single stator and two independently driven rotors. One rotor is connected to the pump and the other to the air blower so that the inertia of the pump drive is reduced and it comes to a stop quicker. The rotor for driving the pump is disposed in an oil-filled compartment so that it is damped. The system is provided with a by-pass valve connecting the discharge side of the pump with its suction controlled by the motor shaft which is biased to open the by-pass valve when the motor is in a deenergized condition. When the motor is energized the shaft is attracted axially electromagnetically and it closes the by-pass valve. When the motor is deenergized it opens the by-pass valve, the pump stops relatively quickly and the blower continues to blow air to ensure burning of all oil supplied from the burner and avoid cooking on the burner and elsewhere.

3,698,640

WAX INJECTION NOZZLE

Virgil V. Stanciu, Rocky River, Ohio, assignor to Tempcraft Tool & Mold, Inc., Cleveland, Ohio

Filed July 14, 1971, Ser. No. 162,480
Int. Cl. B05b *3/18*
U.S. Cl. 239—187 **12 Claims**



A nozzle assembly for injecting a flowable and moldable material, such as hot wax, into a die has an elongated generally cylindrical housing having a discharge nozzle at one end controlled by a valve in the housing which is frusto-conical converging toward the nozzle and seated against a complementary frusto-conical seat. The valve plug has a piston rod extending rearwardly axially of the housing and terminating in a piston housed in a tubular cylinder with pressure fluid means for causing movement of the piston to open and close the valve. An adjustable stop is provided at the rear end of the housing against which an extension of piston engages to limit opening movement of the valve. The housing is adapted to be assembled in a reservoir full of hot wax under pressure which enters through an opening in the housing when the valve is open so as to flow through the nozzle to a mold die. The complete housing is movable endwise through the hot wax reservoir to and from the die to be injected. The means for doing this comprises a piston on the housing which is encased in a tubular cylinder with means provided to apply pressure fluid against one or the other faces of this piston to move the entire housing lengthwise.

3,698,641

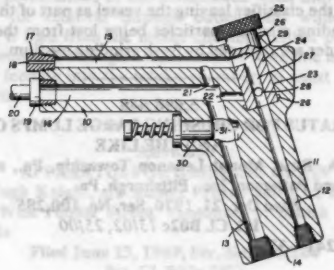
AIR PRESSURE AND VACUUM GUN

Vincent P. Lonardo, 5890 Salt Springs Road, Girard, Ohio

Filed Sept. 29, 1971, Ser. No. 184,803
Int. Cl. B05b *7/04*
U.S. Cl. 239—434 **4 Claims**

An air pressure and vacuum gun incorporates a nozzle communicating with a chamber including Venturi jets arranged to

direct air pressure and a liquid outwardly of the nozzle and alternately create a vacuum to return liquid therethrough.



Valves in a compressed air delivery channel and a fluid connecting channel provide control of the air pressure and vacuum gun.

3,698,642

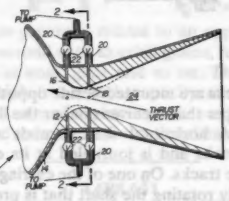
THRUST VECTOR CONTROL SYSTEM

Edward E. McCullough, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Nov. 4, 1966, Ser. No. 592,089

Int. Cl. B63h *25/46*

U.S. Cl. 239—265.23 **4 Claims**



A thrust vector control system for a rocket motor wherein a pair of rows of injection ports are provided circumferentially of the nozzle for injection of fluid thereinto. Means for selectively varying the rate of flow of the fluid injected thereby creating a nonstructural, variable positioned throat to vary thereby the direction of the rocket motor thrust vector.

3,698,643

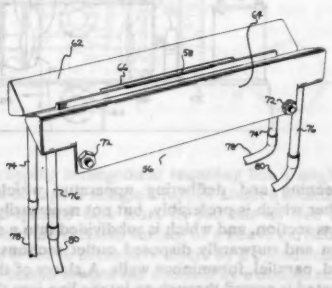
INERT GAS SHIELD FOR ATOMIC ABSORPTION OR FLAME EMISSION SPECTROMETER

John P. Cummings, and Timothy J. Gomoll, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Jan. 15, 1971, Ser. No. 106,824

Int. Cl. B05b *1/28*

U.S. Cl. 239—299 **1 Claim**



This invention relates to the use of an inert gas shield enveloping the flame of either an atomic absorption spectrometer or a flame emission spectrometer to improve the response of cations. Both the sensitivity and the precision of analysis of refractory metals and rare earth oxides are improved by the use of an inert gas shield (e.g., argon) to surround the flame in which the cations are excited. Argon gas is allowed to flow about the flame so as to form an envelope in such a manner as to stabilize the flame, retard oxidation of the ions, and increase concentration of elements in the ground state. Spatial distribution of "free atoms" in the flame has been found to depend not only upon the flame stoichiometry but also on the geometry of the flame, as well as upon a nonchemically active flame edge. The argon envelope gives improved flame geometry by reducing the flame waving and gives a nonchemically active flame edge.

3,698,644

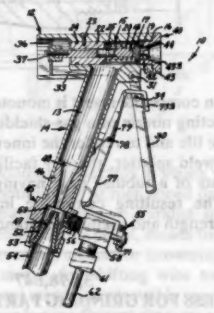
COMBINATION ASPIRATOR AND SPRAY NOZZLE

David L. Nystuen, Bloomington, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Feb. 17, 1971, Ser. No. 116,066

Int. Cl. B05b *7/30*

U.S. Cl. 239—318 **6 Claims**



A portable hand-held spray gun having a hollow handle defining a water passageway therein, a venturi positioned in the water passageway and a product conduit line in communication with the throat of the venturi for injecting product (e.g. a liquid detergent) into the water flow. Two trigger-operated valves separately control the flow of water through the water passageway and the injection of the product into the water flow. A nozzle for forming a variable spray pattern is provided downstream of the venturi, the dimensions of the nozzle orifice and venturi throat being such that the injection rate of the product is essentially constant over a wide range of spray patterns.

3,698,645

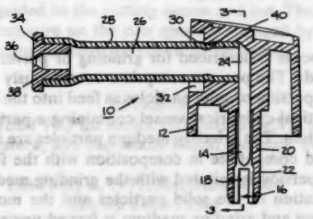
SPRAY HEAD

Charles A. Coffey, Pinellas Park, Fla., assignor to Harris-Paint Company, Tampa, Fla.

Filed March 2, 1971, Ser. No. 120,169

Int. Cl. B05b *1/32*

U.S. Cl. 239—573 **7 Claims**



A sprayhead for a pressurized aerosol dispenser includes an elongated expansion and mixing chamber upstream of the

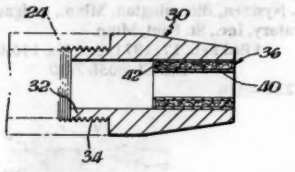
spray-forming nozzle orifice. Controlled expansion of the dispensed product and propellant mixture within the chamber enhances vaporization of the propellant, promotes uniform mixing of the vaporized propellant with the product prior to passage through the spray nozzle, and produces increased flow rates for a given nozzle orifice diameter.

3,698,646

COMPOSITE CARBON INSERT FOR GAS SHIELDED WELDING TORCH NOZZLE

William A. Robba, Shoreham, N.Y., and Earl E. Conabee, Easton, Pa., assignors to Pfizer Inc., New York, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,039
Int. Cl. B05b *1/00*
U.S. Cl. 239—591 8 Claims



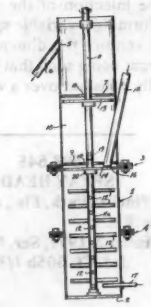
A carbon composite insert is mounted within the removable gas-conducting nozzle of a gas-shielded welding torch to prolong nozzle life and to render the inner surface thereof less adherent to weld splatter, thereby facilitating cleaning. The insert consists of a tubular base having a coating of pyrolytic carbon. The resulting composite insert exhibits enhanced physical strength and spalling resistance.

3,698,647

PROCESS FOR GRINDING PARTICULATE SOLIDS

John David Nye, Prescott, Ontario, Canada, assignor to Ferrox Iron Ltd., Prescott, Ontario, Canada

Filed Dec. 8, 1970, Ser. No. 96,127
Int. Cl. B02c *17/16*
U.S. Cl. 241—24 6 Claims



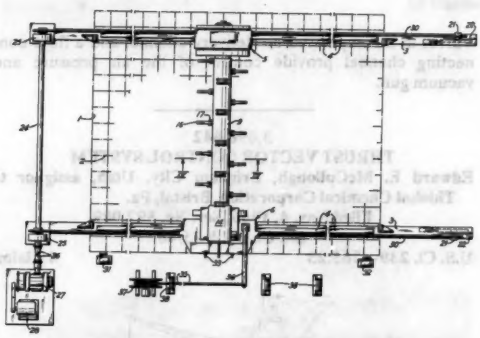
A process is described for grinding or pulverizing particulate solids. The process comprises continuously introducing a fluid dispersion of solid particles as feed into the lower portion of a vertical cylindrical vessel containing a particulate grinding medium. The grinding medium particles are initially larger than and compatible in composition with the feed particles. The dispersion is agitated with the grinding medium to effect pulverization of the solid particles and the moving agitated dispersion and grinding medium is forced upwardly against a fixed suppression plate having a central opening. At this position the mixture is centrifugally classified whereby smaller particles pass through the suppression plate opening as product and the larger particles are retained in the vessel. In this way the grinding medium particles are used until they are totally consumed with particles thereof small enough to pass through the classifier leaving the vessel as part of the product. The grinding medium particles being lost from the vessel in this manner are replaced by fresh grinding medium.

3,698,648

APPARATUS FOR CRUSHING LARGE LUMPS OF COAL AND THE LIKE

Bennie A. Rose, Mount Lebanon Township, Pa., assignor to Heyl and Patterson, Inc., Pittsburgh, Pa.

Filed Dec. 21, 1970, Ser. No. 100,285
Int. Cl. B02c *13/02, 25/00*
U.S. Cl. 241—33 1 Claim



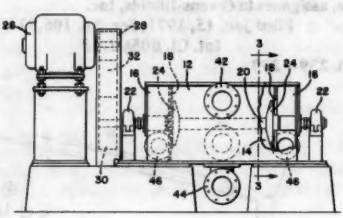
A pair of tracks are mounted beside opposite sides of a grid covering a hopper that receives coal or the like dumped from railroad cars. A horizontal shaft extends across the space between the tracks and is journaled at its ends in carriages mounted on the tracks. On one of the carriages there is means for continuously rotating the shaft that is provided with radially projecting means for striking and crushing lumps of material on the grid as the carriages are moved back and forth along the tracks.

3,698,649

SCREENING APPARATUS

William Herbert, Middletown, Ohio, assignor to The Black Clawson Company, Hamilton, Ohio

Filed Dec. 18, 1970, Ser. No. 99,553
Int. Cl. B02c *13/13*
U.S. Cl. 241—44 6 Claims



Screening and defibering apparatus which includes a chamber which is preferably, but not necessarily, rectangular in cross section, and which is subdivided into a central intake section and outwardly disposed outlet sections by a pair of spaced, parallel, foraminous walls. A slurry of the material to be treated is passed through an intake line into the intake section where it is subjected to mechanical and hydraulic shear forces by a pair of rotors, each of which is rotatably mounted

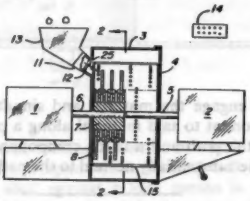
in the intake section in closely spaced relationship to one of the foraminous walls. Accepted portions of the slurry pass through perforations in the foraminous walls into the outlet sections for removal through outlet lines while rejected material is bled from the intake chamber, either periodically or continuously, through a reject line. A rinse line may also be utilized, feeding into the intake chamber, to assist in purging the system.

3,698,650

APPARATUS FOR GRINDING GRAIN

Leslie Hugh Knight, c/o Robert Frayne and Co., Room 212, 1200 West Pender Street, Vancouver 1, British Columbia, Canada

Filed June 13, 1969, Ser. No. 833,104
Int. Cl. B02c 7/02
U.S. Cl. 241—51 1 Claim



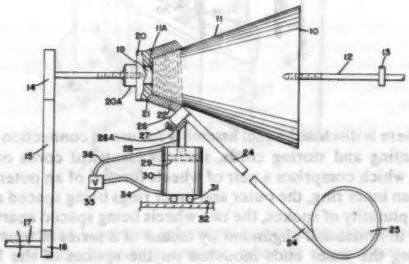
This invention generally relates to an apparatus familiarly known as hammermill used to grind grains, fodders, and gritty materials such as coal, glass and so on. This invention is a hammermill which has a high capacity and more uniform-sized output because of a plurality of counter-rotating hammers, as opposed to known uni-rotational hammermills.

3,698,651

TAPE WRAPPING ARRANGEMENT

Donald Miller, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of Ser. No. 744,513, July 12, 1968, abandoned. This application March 1, 1971, Ser. No. 119,777
Int. Cl. B65h 81/00
U.S. Cl. 242—7.23 7 Claims



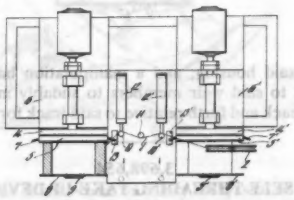
A tape wrapping arrangement requiring but a single drive means, in which tape is shingle wrapped about a rotating mandrel. Preimpregnated tape from its roll has its free end attached to a forward inclined surface of a sleeve carried by the mandrel and is fed in successive layers by a cylindrical roller. The roller is biased toward the mandrel by a double acting air cylinder of a free wheeling carriage. An adjustable knuckle structure interconnects the cylinder piston rod and the roller journal so that selected shingles angles may be wrapped.

3,698,652

CONTINUOUS WINDING APPARATUS

Kasumasa Morikawa, Ichihara-shi; Makoto Kobayashi, Nikko-shi; Hiromitsu Sato, Nikko-shi, and Jun Nakazima, Nikko-shi, all of Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,305
Claims priority, application Japan, Nov. 4, 1968, 43/80456; Nov. 4, 1968, 43/80455; Nov. 4, 1968, 43/96022; Nov. 4, 1968, 43/96021; Nov. 4, 1968, 43/96020; Nov. 21, 1968, 43/85472; Oct. 2, 1969, 44/94050; Oct. 6, 1969, 44/95362; Oct. 6, 1969, 44/79872; Oct. 6, 1969, 44/79871; Oct. 6, 1969, 44/79873; Oct. 6, 1969, 44/79874; Oct. 7, 1969, 44/80135; Oct. 11, 1969, 44/96930; Oct. 13, 1969, 44/81669; Oct. 13, 1969, 44/81668; Oct. 14, 1969, 44/97765
Int. Cl. B65h 54/02
U.S. Cl. 242—25 A 9 Claims



A continuous wire winding apparatus in which wire such as cable wire is wound continuously at high speed onto alternate spool means. The apparatus has two parallel spool driving shafts spaced from each other in a plane, means for driving the driving shafts, wire traversing means for traversing wire to be wound, and shifting means for shifting wire to be wound between the shafts. Spool means is removably mounted on the shafts, each spool means having flanges thereon, an end plate mounted coaxially with the spool means at one flange of the spool means, and a wire catcher projecting from the circumference of the end plate. A barrel is mounted coaxially with the spool means for having wound thereon the finishing end portion of the wire to be wound, and a cover is non-rotatably mounted around the outside circumferential surface of said barrel for preventing whipping of the free end of the wire. A wire guide means is mounted between the shafts and movable parallel to the shafts for engaging the wire being wound on one spool means and guiding it to the wire catchers on said spool means during transfer to the other spool means. Means is connected to the wire guide means for moving the wire guide means, and wire cutting means is provided adjacent the wire guide means to which the wire being shifted from one spool means to the other is guided for being cut by the guide means and said wire catcher on the one spool means. Wire extending through the traversing means and shifting means is wound on one spool means while being traversed back and forth along the spool means as the spool means is rotated on one of the shafts, and when a predetermined amount of wire has been wound, the shifting means is moved to transfer the wire to the other spool means and the wire is engaged by the wire guide means and guided to the cutting means and cut. The end portion of the cut wire on the one spool is engaged by the wire catcher and caught within the cover on the barrel.

3,698,653

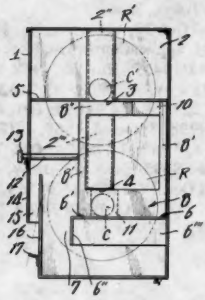
TOILET PAPER ROLL HOLDING DEVICE

Tadasu Okamura, 261 Narashino Machi 4-chome, Funabashi, Japan

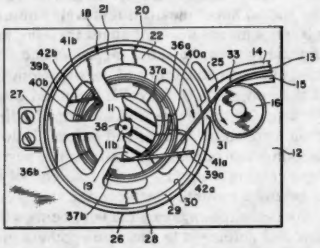
Filed May 5, 1971, Ser. No. 140,324
Int. Cl. B65h 19/04
U.S. Cl. 242—55.3 7 Claims

A toilet paper roll holding device comprising a housing; a pair of opposite and spaced vertical paper roll guide groove forming means provided within said housing; track means pro-

vided within said housing below said guide groove forming means; weir members slidably received in said track means for blocking and allowing the falling of a toilet paper roll by gravity within said housing; and a manipulation bar operatively connected to said weir members to slidably move the weir members back and forth relative to said track forming means.



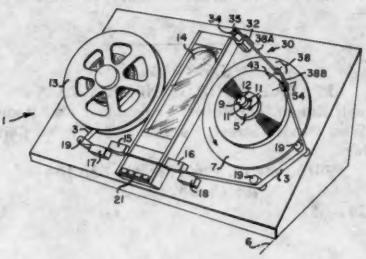
3,698,654
SELF-THREADING TAKE-UP DEVICE
Norman John Rosenburgh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 27, 1970, Ser. No. 93,205
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **12 Claims**



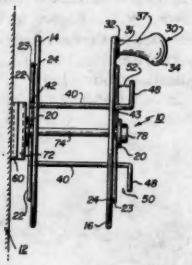
A self-threading strip take-up hub, adapted to wind thereabout web-like strips of different widths, is provided with a flexible snubber member extending from the hub for respectively securing the leading ends of such strips to the hub at a location opposite a predetermined point on the winding axis of the hub. Several pairs of flexible guide members extend from the take-up hub with each of the guide members forming a particular pair attached to the hub respectively at locations equidistant in opposite axial directions from the predetermined point on such hub axis. The guide members of a particular pair are separated by a distance slightly greater than the width of a corresponding one of the strips to guide the same for winding about the take-up hub centered on such predetermined axial point.

3,698,655
PACKING GUIDE FOR FLEXIBLE MATERIALS
David T. L. Chang, 438 College Avenue, Palo Alto, Calif.
Filed Dec. 21, 1970, Ser. No. 99,842
Int. Cl. B65h *27/00*
U.S. Cl. 242—76 **6 Claims**

A packing guide for guiding the path of a relatively moving flexible material, e.g. magnetic tape, entering a storage reel, the guide comprising an elongated arm pivotable about a given point, the arm being pivotal along a horizontal plane and vertical plane relative to the path of the flexible material; a roller mounted intermediate the terminal ends of the arm and adapted to engage the material and simultaneously apply a force component to said material along a plane substantially parallel to the path and a force component to said material along a plane substantially normal to the path.



3,698,656
CORD STORAGE REEL ASSEMBLY
William C. Ballenger, Highland Park, Ill., assignor to Central Specialties Co., Chicago, Ill.
Filed Oct. 26, 1971, Ser. No. 192,374
Int. Cl. B65h *75/20, 75/38*
U.S. Cl. 242—106 **6 Claims**



There is disclosed a reel assembly for use in connection with mounting and storing cords, such as electrical cords or the like, which comprises a pair of wheels formed of an outer ring and an inner ring, the outer and inner rings being spaced apart by a plurality of spokes, the two wheels being spaced apart and held in horizontal alignment by means of a series of four rods having the inner ends mounted on the spokes of the inner wheel and the outer ends of the rod being mounted on the spokes of the outer wheel, the outer ends of the rods extending outwardly from the spokes of the outer wheel for a short distance and being turned upwardly in the direction of the outer ring of the associated wheel forming a hook member, the four hook members cooperating to form an auxiliary reel external of the storage reel, a support plate for mounting the storage reel to a support surface, a shaft provided for mounting the reel in rotatable relation to a support surface, and mounting means for mounting the shaft to an underlying support surface.

3,698,657

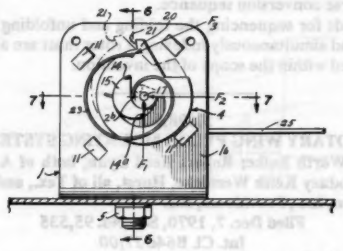
INERTIA OPERATED LOCKING RETRACTOR

Horst-Guenter Kirchhoff, Luettmelland 36, 2 Hamburg 68; Peter Pfabe, Garstedter Weg 210, 2 Hamburg 61, and Gerhard Sedlmayr, Koniggratzstrasse 1, 2 Hamburg 52, all of Germany

Continuation-in-part of Ser. No. 757,357, Sept. 4, 1968, abandoned. This application Sept. 1, 1970, Ser. No. 68,744

Int. Cl. A62b *35/00*

U.S. Cl. 242—107.4 2 Claims



An inertia operated locking retractor in which angular acceleration of the spool upon which a safety belt is mounted causes a pawl to abut against a lock means in preventing further rotation of the spool and further unwinding of the safety belt therefrom.

3,698,658

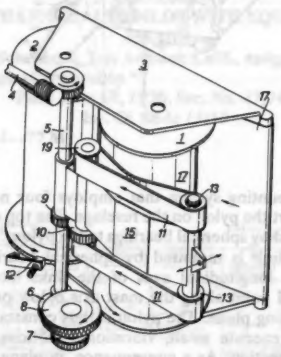
RECORDING APPARATUS FOR SONAR AND ECHO SOUNDING SYSTEMS

Inge Skei, 3155 Birkely, Asgardstrand, Norway

Filed Nov. 25, 1969, Ser. No. 879,917

Int. Cl. G11b *15/32*; B65h *17/08*

U.S. Cl. 242—192 6 Claims



The present invention relates to a recording apparatus for sonar and echo sounding systems, wherein a recording strip runs with constant linear velocity from an unwinding spool to a rewinding spool. The paper feed is preferably driven by driving means slipably coupled to the rewinding spool, the constant linear velocity of the paper being set by second driving means which are frictionally, but non-slipably, coupled to the recording strip roll formed on the rewinding spool.

This driving arrangement allows both spools to be mounted in a common cartridge, which may be rapidly and easily inserted in and removed from the apparatus by means of a few simple, uncritical manual operations, the spools being preferably disposed symmetrically and with parallel axes in said replaceable cartridge, to allow an easy interchange of positions and working functions of the spools by simply turning the cartridge half a revolution.

3,698,659

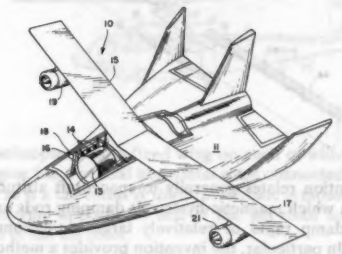
FERRY SYSTEM

Thomas A. Blackstock, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 24, 1970, Ser. No. 66,206

Int. Cl. B64c *37/00*

U.S. Cl. 244—1 SS 2 Claims



This invention relates to an auxiliary lift system to provide a means of transportation for large lifting entry vehicles.

3,698,660

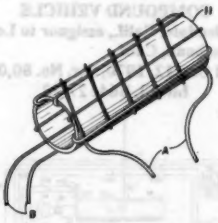
VARIABLE MAGNETIC HYSTERESIS ROD SYSTEM

Frederick F. Mobley, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 7, 1970, Ser. No. 78,770

Int. Cl. B64c ; H02k *49/00*

U.S. Cl. 244—1 R 7 Claims



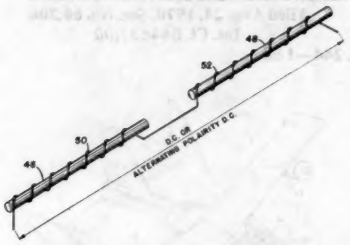
A variable magnetic hysteresis rod system capable of being controlled to provide varying amounts of hysteresis damping for a spacecraft. An elongated rod of magnetic hysteresis material is surrounded by one or more short sleeve members formed of chargeable magnetic material. Two windings are wound about the sleeve member and are energizable selectively with current pulses. One of the windings, when energized, produces a localized longitudinal magnetic field in the adjacent region of the magnetic hysteresis rod of sufficient magnitude to saturate that portion of the rod and thus cause the rod to act as a plurality of rods which collectively provide an amount of hysteresis damping different from that provided by the single rod. The second winding, when energized, destroys the effectiveness of the magnetic field produced by the first winding and thus returns the adjacent portion of the hysteresis rod to a non-saturated condition wherein the hysteresis rod again acts as a single rod, with its associated amount of hysteresis damping capability.

3,698,661

CONTROLLABLE HYSTERESIS DAMPING

Theodore Wyatt, Union Bridge, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 7, 1970, Ser. No. 78,772
Int. Cl. B64c ; H01f 21/08
U.S. Cl. 244—1 AS 15 Claims



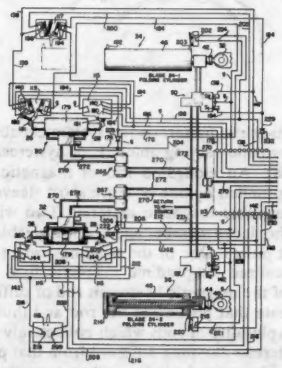
The invention relates generally to spacecraft attitude stabilization in which magnetic hysteresis damping rods are employed to damp rapid or relatively large oscillations of a spacecraft. In particular, the invention provides a method and means for inducing a local magnetic field within the damping rods after substantial damping of the large oscillations in order to reduce the effect of the earth's magnetic field on the rods, thus eliminating persistent low-order oscillations of the spacecraft due to continuing dipole interaction of the rods with the magnetic field of the earth. According to one embodiment of the invention, electrically conductive coils disposed around a magnetically permeable hysteresis damping rod are electrically energized, thus inducing within the rod a local magnetic field of sufficient magnitude such that the earth's field produces only a slight and substantially invariant magnetic induction in the rods.

3,698,662

APPARATUS AND METHOD FOR SEQUENCING THE FOLDING AND UNFOLDING OF ROTOR BLADES IN A COMPOUND VEHICLE

Nels C. Rostad, Glendale, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 12, 1970, Ser. No. 80,045
Int. Cl. B64c 27/22
U.S. Cl. 244—7 A 51 Claims



Apparatus for simultaneously sequentially folding and unfolding rotor blades in a rotor assembly and indexing a rotor mast thereof the elements of the apparatus including a rotor mast, power servo mechanisms for indexing the mast, sequentially-operated mechanisms for engagement with means, such as pins, mounted on the mast for controlling the degree of indexing, blade folding and unfolding actuator means, additional power servo mechanisms controlling such actuator means, means for releasing and securing blades from their connections in their unfolded extended positions in order to fold them about the mast simultaneously with the indexing thereof, and a hydraulic system and electrical elements including switching means and arrangements operatively actuable for achieving operation of the apparatus, whereby the rotor blades are sequentially folded and mast indexed in one conversion sequence and sequentially unfolded and mast indexed in a reverse conversion sequence.

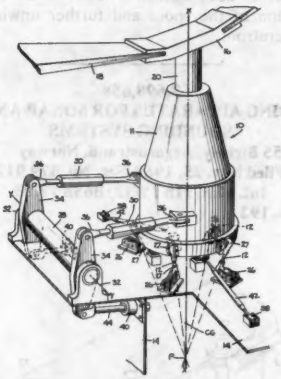
Methods for sequencing the folding and unfolding of rotor blades and simultaneously indexing a rotor mast are also comprehended within the scope of the invention.

3,698,663

ROTARY WING PYLON MOUNTING SYSTEM

Rodney Worth Balke; Robert Reed Lynn, both of Arlington, and Rodney Keith Wernicke, Hurst, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Dec. 7, 1970, Ser. No. 95,535
Int. Cl. B64c 27/00
U.S. Cl. 244—17.27 8 Claims



A pylon mounting system that employs four non-resilient links to support the pylon on the fuselage. The top end of each link is mounted by spherical bearings to the pylon. The bottom end of each link is mounted by spherical bearings to the fuselage. The longitudinal axes of the links intersect at a predetermined point along the mast axis below or above the normal mounting plane. The pylon is thus constrained by the four links to execute small, vibrational motions about this point of intersection. As a consequence, in-plane vibrational forces from the rotor blades are transmitted to the fuselage as an in-plane vibrational force at this point of intersection. A first moment about the center of gravity of the fuselage is created by this in-plane focused force. In addition, there are elastomeric elements between the fuselage and the pylon which provide an in-plane restoring force in response to rotor blade induced pylon vibrations. This restoring force provides a second moment about the fuselage center of gravity. The point of intersection of the links and of the spring rate of the elastomeric elements are selected such that these first and second moments tend to cancel one another.

Pylon inertial reaction is enhanced because the pylon rotates about this point of intersection. Thus, isolation of the fuselage is enhanced.

3,698,664

AIRCRAFT

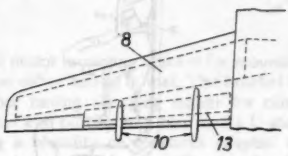
Kenneth Victor Bonney, Welwyn Garden City, England, assignor to Hawker Siddeley Aviation Limited, Surrey, England

Filed Jan. 11, 1971, Ser. No. 105,522

Claims priority, application Great Britain, Jan. 12, 1970, 1,476/70

Int. Cl. B64c *3/50*

U.S. Cl. 244—42 DA **10 Claims**



In an aircraft wing flap extending and retracting assembly, the flap is carried from a pivotal mounting on a downward extension of a main bogie that runs in a main track fixed to the trailing portion of the wing, and is additionally supported, at a position displaced in the fore-and-aft direction from the main pivot, by a support member that depends from a further pivot on the main bogie and carries a runner travelling along a incidence control track. Both the main and incidence control tracks are above the recess in which the flap is housed when retracted, and above the path followed by the flap when it extends, so that the flap is not interrupted to allow passage of either track. A tab pivoted on the flap is operated by a linkage connection to the main bogie.

3,698,665

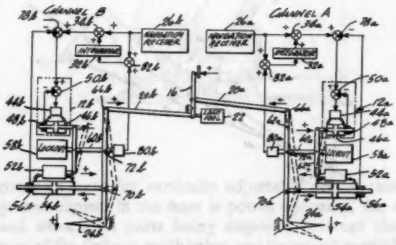
MULTICHANNEL AUTOPILOT WITH EQUALIZATION MEANS

Robert E. Schenbeck, Los Angeles, Calif., assignor to McDonnell Douglas Corporation

Filed June 19, 1970, Ser. No. 47,741

Int. Cl. B64c *13/50*

U.S. Cl. 244—77 M **3 Claims**



A multichannel automatic flight control system (AFCS) with equalization means for interfacing the two or more relatively independent channels thereof including means to sense relative imbalance between the channels and/or to sense inoperativeness in one of the channels.

3,698,666

HIGH-SPEED HELICOPTER CHARACTERIZED BY A LIFTING WING AND BY TWO ENGINES FITTED THEREON

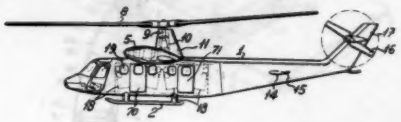
Giancarlo Monti, Varese, Italy, assignor to Siai-Marchetti S.p.A., Varese, Italy

Filed Jan. 19, 1970, Ser. No. 4,143

Claims priority, application Italy, Jan. 24, 1969, 11961 A/69

Int. Cl. B64c *27/22*

U.S. Cl. 244—7 A **7 Claims**



A helicopter with a fixed wing on each of which is located an engine has a central horizontal rotor connected to both engines, as is a tail rotor. A third rotor blade is mounted directly on the wing opposite to that of the tail rotor to blance the torque of the tail rotor.

3,698,667

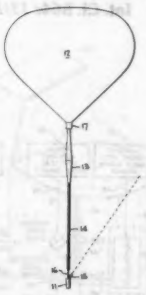
SYSTEM FOR STABILIZING TORQUE BETWEEN A BALLOON AND GONDOLA

David K. Studenick, Beltsville; Allen L. Tyler, Baltimore, and Walter Squillari, Greenbelt, all of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed March 24, 1971, Ser. No. 127,618

Int. Cl. B64b *1/40*

U.S. Cl. 244—32 **8 Claims**



A balloon is connected to a stabilized gondola by a parachute having shroud lines. The top of the parachute is connected to the balloon via an active bearing having a motor driven in response to the output of a torque sensor connected between the shroud lines and gondola. In response to the sensed torque exceeding a predetermined level, pulses are periodically applied to the active bearing to limit the torque buildup between the balloon and gondola to a low value.

3,698,668

VARIABLE CAMBER AIRFOIL

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

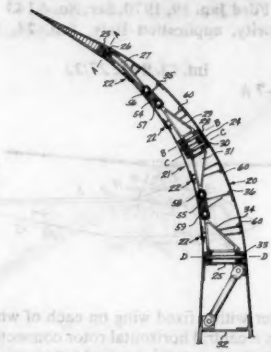
Filed April 8, 1971, Ser. No. 132,452

Int. Cl. B64c *3/48*

U.S. Cl. 244—44 **7 Claims**

A variable camber mechanism for an aerodynamic surface wherein a series of truss members are pivotally mounted on

canted hinges and arranged in a general chordwise alignment of an aerodynamic surface. When the members are actuated through a screw-drive mechanism to rotate out of alignment, they provide a chordwise contraction force which through a



slip jointed undersurface, in the case of an airplane wing, permits the shortening of that surface relative to the upper surface and thereby provides the desired camber to the aerodynamic surface.

3,698,669

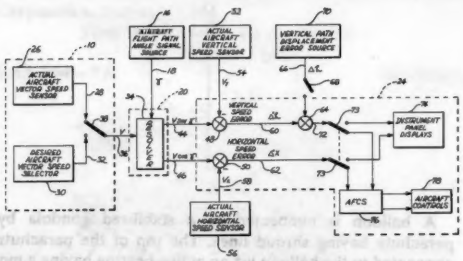
METHOD AND APPARATUS FOR CONTROLLING THE FLIGHT PATH ANGLE OF AIRCRAFT

Justin G. Miller, deceased, late of Los Angeles, Calif. (by Rita Ann Miller, administratrix), assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 845,113, May 29, 1969. This application March 16, 1970, Ser. No. 19,813

Int. Cl. B64c *13/18*

U.S. Cl. 244—77 A **16 Claims**



A flight command system resolves an aircraft vector speed signal as a function of the vertical and horizontal components of a selected aircraft flight path angle to respectively produce commanded vertical and horizontal speed signals. The speed command signals are respectively compared with actual values of aircraft vertical and horizontal speeds to produce vertical and horizontal speed error signals, respectively, and the speed error signals indicate the deviation of the aircraft from the selected flight path angle. The system achieves vector speed control and flight path angle control simultaneously when the aircraft vector speed signal represents a desired aircraft vector speed. When a vertical path displacement error signal is combined with the commanded aircraft vertical speed signal, the system achieves flight path angle control along a specific path in space.

3,698,670

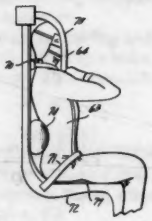
VERTEBRAL FRACTURE PREVENTION SYSTEM

Channing L. Ewing, Pensacola, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 17, 1970, Ser. No. 99,197

Int. Cl. B64d *25/06*

U.S. Cl. 244—122 AG **20 Claims**



Disclosed herewith is a vertebral fracture prevention system which incorporates motor driven body restraint devices for positioning and holding a person in a safe postural position within a rapidly moving craft immediately prior to his being subjected to $+G_z$ acceleration generated by any means including forceful ejection. Also included is a resilient inflatable bag or other device that is disposed against the back of said person which is inflated or otherwise actuated in such a manner immediately prior to exposure to $+G_z$ acceleration as to cause the thoraco-lumbar region of the spinal column thereof to assume an arcuate posterial curvature due to hyperextension thereat, so as to prevent wedge fractures of the forward edges of the adjacent vertebrae thereof as a result of their being exposed to extreme anterior bending acceleration forces.

3,698,671

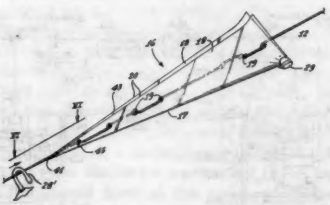
KITE PARACHUTE UNIT WITH AUTOMATIC EJECTOR

Walter D. Barry, 629 South Arizona Avenue, Los Angeles, Calif.

Continuation-in-part of Ser. No. 874,591, Nov. 6, 1969, abandoned. This application May 12, 1971, Ser. No. 142,522

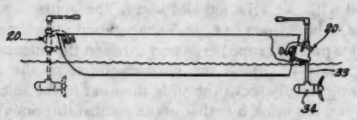
Int. Cl. B64c *31/06*

U.S. Cl. 244—155 R **7 Claims**



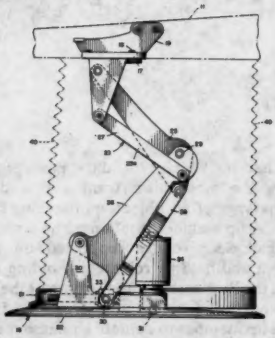
A novel kite unit including an automatic ejector along the kite line and positioned near the kite end. This unit includes a stop disc near the lower end of the kite line and a parachute unit which is movable on the kite line from the stop disc upwards to the automatic ejector where the parachute is disengaged and is brought to earth by means of gravity, the parachute spreading its canopy during descent in order to effect a slow rate of downward travel.

3,698,672
OUTBOARD MOTOR MOUNTING BRACKET
Arthur E. Gilbert, Alva, Fla., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Dec. 27, 1971, Ser. No. 212,319
Int. Cl. B63h 21/26
U.S. Cl. 248—4 10 Claims



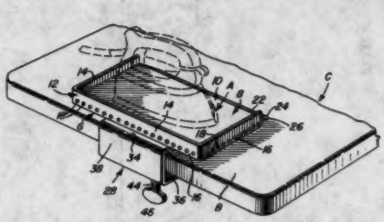
An outboard motor mounting bracket for mounting an outboard motor on either end of a boat. The bracket includes a bracket member having clamping means for clamping the bracket to either end portion of a boat and a U-shaped body portion having a plurality of apertures adapted to receive either a pivot pin or a locking bar. The bracket further includes support means for supporting an outboard motor with the support means being pivotally secured to the bracket member by means of the pivot pin being received by an aperture formed in the support means and being received by a pair of axially aligned apertures in the bracket member. Means for releasably receiving a locking bar are provided in association with the support means whereby the support means is releasably held to the bracket member and upon release from the locking bar is pivotable about the pivot pin into a plurality of attitudes with respect to the bracket member.

3,698,673
BASE FOR ADJUSTABLE CHAIRS
Robert A. Olsen, Palatine, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Feb. 16, 1971, Ser. No. 115,384
Int. Cl. A47c 1/04
U.S. Cl. 248—421 16 Claims



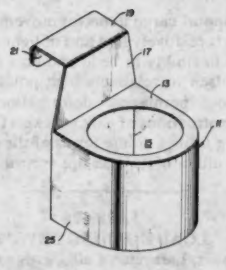
A compact base for vertically adjustable dental chairs. A linkage mechanism in the base is power operated, the motor unit and associated parts being disposed between the side members of the linkage mechanism and being substantially enclosed by such mechanism and other members of the base when the chair is in its lowered position. A one-way drive mechanism is provided, the chair traveling downwardly only under the influence of gravity when the motor is reversed. Increased safety upon lowering of the chair is thereby achieved because if the chair encounters an obstruction while moving downwardly, the applied forces will be limited to the gravity load. Such a construction also yields improved access for maintenance and assembly of the base.

3,698,674
SAFETY IRON HOLDER
Mary T. Paone, 301-A Walnut Street, Bristol, Pa.
Filed Jan. 29, 1971, Ser. No. 111,025
Int. Cl. D06f 79/02
U.S. Cl. 248—117.6 2 Claims



An iron rest comprising a fire resistant receiver characterized by a rectangular tray having a C-clamp by way of which it can be adjustably and detachably mounted on a transverse end of an ironing board. The tray overlies the ironing surface and has one lengthwise edge open and provided with an outstanding flange which is angled and slopes toward and rests atop the surface and provides an iron gliding and guiding ramp which facilitates sliding the iron into the receiver for temporary storage. Lower portions of the walls of the frame or rim are provided with ventilating holes.

3,698,675
PORTABLE HOLDER
Wilford J. Lerew, 317-23rd Avenue North, Minneapolis, Minn., and Kenneth T. Peckels, 1939 Fillmore Street, N.E., Minneapolis, Minn.
Filed March 8, 1971, Ser. No. 121,982
Int. Cl. A47k 1/08
U.S. Cl. 248—311 7 Claims



The holder comprises a body portion including a concavity to receive a receptacle; a hanger therefrom uprising from the body portion and terminating in an offset portion to grip chair backs or the like. Cushioning and/or insulation material is received in the body from a rear opening for receiving the receptacle. The thermal insulation may comprise a non-split or a partly split block having an opening therein to accommodate various size receptacles.

3,698,676
ASSEMBLY FOR STRUCTURAL FRAMING UNIT
Junius T. Moore, Jr., Charlestown, W. Va., assignor to The Moore Company, Charleston, W. Va.
Filed July 27, 1970, Ser. No. 58,636
Int. Cl. F16m 13/00
U.S. Cl. 248—317 7 Claims

An improved framing unit assembly for carrying suspended loads is described. The assembly includes an elongate frame

member which is essentially hollow with a channel opening defined along one side, together with a bolt means which can be received within the hollow space of the frame member to

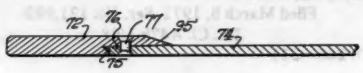
reinforce the frame member when loaded. The bolt means includes a middle section which is shaped to fit within the channel opening of the frame member so as to prevent collapse of the member in the region of its channel.

3,698,677

PALLET FOR MOVING AND SECURING CARGO

Robert Looker, Santa Monica, Calif., assignor to Satco Inc., El Segundo, Calif.

Filed Jan. 22, 1970, Ser. No. 4,882
Int. Cl. B65d *19/38*
U.S. Cl. 248—346 **13 Claims**



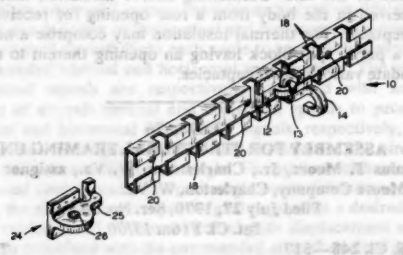
A pallet to support cargo items for movement over ball mats and roller trays is relatively thin and of light weight and of sufficient resilient flexibility to bend and bow out of its plane to accommodate itself to relatively high points of a supporting structure without permanent deformation. The invention teaches new constructions of pallet sockets for engagement by cargo anchoring fittings. Some forms of the pallet are reversible for use with either of its faces uppermost.

3,698,678

LOAD HOLDING DEVICE

Thomas S. Bowers, Lafayette, Calif., assignor to A. L. Hansen Mfg. Co., Gurnee, Ill.

Filed June 2, 1970, Ser. No. 42,736
Int. Cl. B65j *1/22*; B65d *19/00*
U.S. Cl. 248—361 R **9 Claims**



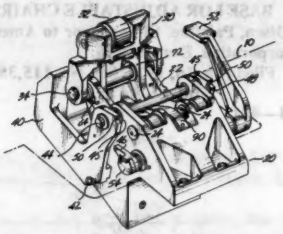
This disclosure pertains to a load holding device which is quickly and easily adjustable to a plurality of positions. The load holding device consists basically of a guide rail, or track in which a slide member or carriage is adapted for movement to a plurality of locations. The guide is provided with slots, the sides of which form an abutment. The majority of the slide member is encompassed within the guide means but a portion may protrude outwardly to enable the user to manually move the slide member to the desired location. The slide member has an opening extending through it which is adapted to be aligned with the selected slot within the guide rail. When so aligned, a hook member (an S-shaped belt attaching device or merely a piece of rope) is passed through the selected slot and the opening to attach the hook member to the slide. The foregoing fixedly locks the slide member in the selected position since the hook member abuts against the sides of the slot in the guide rail to prohibit movement thereof. The guide member may be constructed of a flat channel-shaped member or may be of a tube-like construction. In both cases, a plurality of guide rails may be used and one may be telescoped within the other in curtain rod-like fashion so that the combination slide and hook member also fixes the relative positions of the respective guide rails.

3,698,679

SEMI-AUTOMATIC RESTRAINT MECHANISM

John M. Lang, Bellevue, and Robert D. Trautman, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 11, 1970, Ser. No. 97,240
Int. Cl. B61d *45/00*
U.S. Cl. 248—361 R **11 Claims**



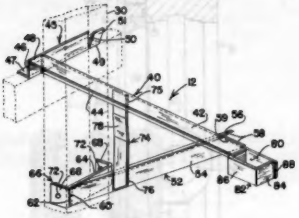
A mechanism which will allow passage of an object approaching the mechanism from a first direction but will prevent passage of an object approaching from the opposite direction. A lip member is mounted on a spring biased carrier beam which is pivotally supported on the base of the mechanism and held by releasable holding means in position to extend the lip member into the path of the object. An object which impacts the lip member from the first direction will cause the lip member to actuate a release means to allow rotation of the carrier beam away from the object. The spring biasing of the carrier beam maintains the lip member in contact with the near surface of the object, and causes the lip to return to its original position when the object moves past the mechanism. Impact loads imparted to the lip member from the opposite direction are rigidly resisted by the lip member, the carrier beam member and the holding means. The preferred embodiment involves an aircraft cargo deck mechanism which is specifically designed to be installed in a limited space envelope near the cargo door to allow movement of cargo into the aircraft but to prevent inadvertent movement back through the door. Other features of the preferred embodiment include a self-locking tiedown clamp, and a manually actuated lever for releasing the clamp and for locking the mechanism in an inoperative position below the level of the deck during unloading operations.

3,698,680

SCAFFOLD-SUPPORTING BRACKET FOR A CONCRETE WALL FORM

James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Feb. 12, 1971, Ser. No. 115,002
Int. Cl. E04g 3/08
U.S. Cl. 249—189 4 Claims



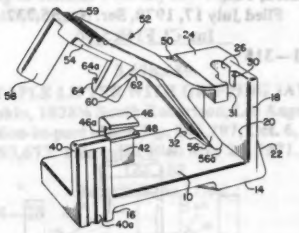
A unitary one-piece scaffold-supporting bracket for a concrete wall form, which requires no fastening devices or other concrete hardware for its installation on the form, and which automatically locks itself in position at the time it is applied to the form.

3,698,681

ON-OFF CLAMP FOR I. V. SYSTEMS

Robert L. Lacey, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 15, 1970, Ser. No. 98,247
Int. Cl. F16k 7/06
U.S. Cl. 251—10 7 Claims



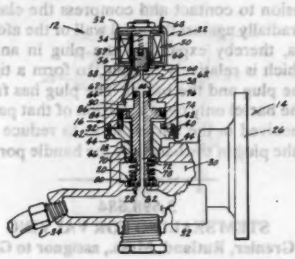
A clamp for control of fluid flow through tubing, such as in intravenous tubing systems, with a base through which the tubing is passed and releasably held in adjacency to a fixed abutment surface on the base, and with a member hingedly connected to the base and provided with a clamping member movable in unison therewith relative to the abutment surface for clamping the adjacent portion of the tubing thereagainst and closing or partially closing the same; there being provided mutually cooperating interlocking arms on the base and hinged member, respectively, for holding the same in predetermined tube clamping positions, and being relatively laterally movable to release the interlocking engagement between the arms to permit separating movement between the base and hinged member with the clamping member moving away from the abutment surface, thus releasing the constriction in the previously clamped tubing.

3,698,682

SOLENOID ACTUATED VALVE FOR ANHYDROUS AMMONIA FLOW METERS

Eugene B. Berning, Marienthal, Kans., and John E. Holmes, P.O. Box 1111, Garden City, Kans.

Filed Jan. 25, 1971, Ser. No. 109,328
Int. Cl. F16k 31/383
U.S. Cl. 251—30 7 Claims



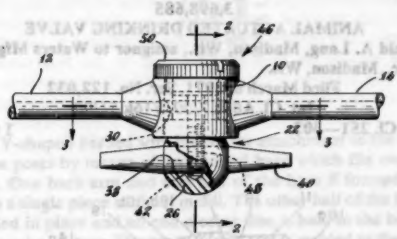
A solenoid actuated valve operator is used for controlling the flow of a normally gaseous fluid in a conduit having an internal valve seat. A housing is mountable with the conduit. A solenoid mounts with the housing. A plunger extends from the housing, which receives fluid pressure. A passageway through the plunger communicates with the solenoid and a valve closer on the extended end thereof. The core of the solenoid operates to open and close the passageway. Another passageway connects the solenoid assembly and the outside of the housing. The plunger is urged to extended position by a resiliently applied force. The solenoid actuated valve operator when mounted contacts with the valve closer the conduit valve seat. With the core member disengaged liquid fluid pressure exerts a force on the plunger overcoming the resilient force to retract the plunger and open the conduit.

3,698,683

VALVE FOR LABORATORY GLASSWARE

William M. De Angelis, Wilton, Conn., assignor to Daran Products, Inc., Norwalk, Conn.

Filed June 23, 1970, Ser. No. 49,085
Int. Cl. F16k 5/04
U.S. Cl. 251—209 11 Claims



A valve including a tapered glass barrel having a fluid inlet and an outlet in the wall structure thereof, receiving a rotary fluorocarbon or equivalent plug having a handle portion by which it may be turned in the barrel on its axis, having a complementally tapered portion; the plug, or the plug and the barrel together, defining a fluid passageway between the inlet and outlet when the plug is in an angularly adjusted position thereof. The construction and arrangement of the elements may be such that flow of a liquid through the valve may be visually observed. The plug, which is formed of deformable material, is provided with an axial recess within the portion thereof which is received in the barrel and opening through the smaller tapered end of the plug, providing a relatively thin-

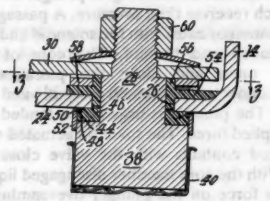
walled portion of the plug. An elastomer insert is provided in the recess and a fastener unit is provided to maintain the elements in assembled position which unit comprises a threaded shank which in assembled position is secured to the plug extending axially thereof. The fastener unit also comprises a member co-acting with the shank, overlying the end of the barrel opposite the handle portion of the plug to prevent, with the taper of the barrel and the plug, axial dislocation of the plug. The last-named fastener member is provided with an axial extension to contact and compress the elastomer insert to force it radially against the axial wall of the aforementioned plug recess, thereby expanding the plug in an axial region thereof, which is relatively flexible, to form a tight fluid seal between the plug and the barrel. The plug has frictional contact with the barrel only over a portion of that part of the plug which is received in the barrel, so as to reduce resistance to turning of the plug in the barrel by the handle portion.

3,698,684

STEM SEALING FOR VALVING

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.

Filed Sept. 17, 1970, Ser. No. 73,095
Int. Cl. F16k *41/04*
U.S. Cl. 251—214 **10 Claims**



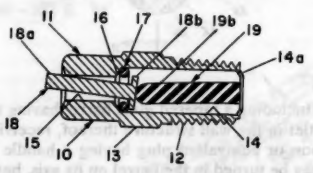
A stem seal for a valve which comprises a face seal closely held between a shoulder on the stem and the interior of the valve housing by means of a wave washer under the handle; there being a bearing for the stem, the bearing tightly engaging the exterior of the valve housing and lying under the wave washer, together with a resilient grounding clip exerting outward pressure on the stem and the face seal, and means for preventing extrusion of the face seal.

3,698,685

ANIMAL ACTUATED DRINKING VALVE

Ronald A. Lang, Madison, Wis., assignor to Waters Mfg. Co., Inc., Madison, Wis.

Filed March 8, 1971, Ser. No. 122,032
Int. Cl. A01k *7/00*; F16k *51/00*
U.S. Cl. 251—303 **1 Claim**



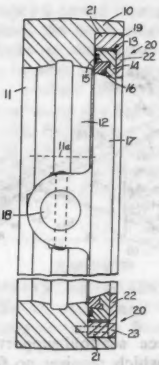
An animal actuated drinking valve having a tubular body member encasing an actuating pin with a rear flange portion which is urged forwardly by an elongate resilient biasing member to create a releasable liquid-tight seal with an O-ring in the tubular body member. In use, an animal nudges the protruding actuating stem portion of the pin causing the rear flange portion to unseat from the O-ring allowing water to flow through the valve.

3,698,686

BUTTERFLY TYPE FLUID CONTROL VALVES

William Williams, Newport, England, assignor to Serck Industries Limited, Birmingham, England

Filed Oct. 10, 1969, Ser. No. 865,317
Claims priority, application Great Britain, Oct. 15, 1968, 48,847/68
Int. Cl. F16k *1/228*
U.S. Cl. 251—306 **3 Claims**



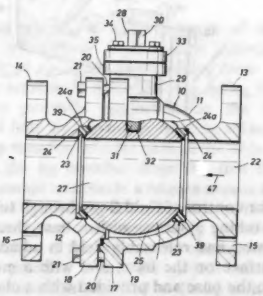
The closure vane of a butterfly valve is formed at its periphery with a part-spherical surface which is engageable with a seat ring. The seat ring is free to move in a plane perpendicular to the axis of the valve passage. The pivotal axis of the vane is offset both from the center of the spherical surface and from the axis of the valve passage, so that as the vane starts to open, its periphery lifts away from the seat ring.

3,698,687

ROTATORY VALVE HAVING ONE-PIECE SEAT CONSTRUCTION

Masaru Kitamura, Tokyo, Japan, assignor to KTM Industries, Inc., Houston, Tex.

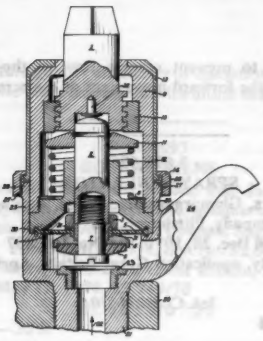
Filed July 17, 1970, Ser. No. 55,737
Int. Cl. F16k *5/06*
U.S. Cl. 251—315 **9 Claims**



A ball valve comprising a valve casing having a flowway therethrough, a spheroidal or spherical valve element having a passageway therethrough, said valve element being rotatably mounted within said valve body whereby said passageway can be moved into and out of register with said flowway, and a pair of valve seat members disposed within said valve casing forming a space between them for said valve element, said seat members being annular and each having in cross-section a body portion and an inwardly extending flange portion, said flange portion being deformable and having opposing faces, at

least a portion of which are parallel and inclined to a plane radial to the axis of said flowway so as to provide substantially tangential engagement between one of said faces of each of seat members and said valve element.

3,698,688
WATER FAUCETS
Hugo Joseph Kutz, 504 Western Avenue, Grafton, N. Dak.
Filed July 16, 1970, Ser. No. 55,310
Int. Cl. F16k *41/04*
U.S. Cl. 251—335 **4 Claims**

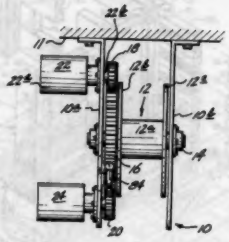


A water faucet in which the action is definitely of the poppet-valve type. The parts are sealed off from all water so that the arrangement of the parts eliminates the use of stuffing boxes, packing glands, O-rings, presently employed in faucets. Use is made of a specially designed flexible diaphragm having a formed collar at its inner and outer perimeters by means of which it can be securely anchored in position to prevent water from coming in contact with any moving portion of the faucet above said diaphragm.

3,698,689
STAPLE LIFTER WITH GRIPPING JAWS
Irvin C. Poskin, 1828½ South Robertson, Los Angeles, Calif.
Continuation-in-part of Ser. No. 863,797, Oct. 6, 1969, Pat. No. 3,583,673. This application May 24, 1971, Ser. No. 146,182
Int. Cl. B25c *11/00*
U.S. Cl. 254—28 **9 Claims**

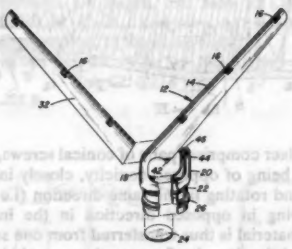
A staple-lifting tool has a pointed lower jaw adapted for insertion beneath a staple bridge and an upper jaw spaced closely above the lower jaw by a slot in which the bridge is received and closely confined substantially throughout the width of the staple by moving the tool forwardly until the flaring sides of the jaws span the width of the staple as it is drawn upwardly.

3,698,690
HYDRAULICALLY OPERATED WINCH
Robert D. Beaver, Coos Bay, Oreg., assignor to Koontz Machine & Welding, Inc., Coos Bay, Oreg.
Filed Dec. 31, 1970, Ser. No. 103,185
Int. Cl. B66d *1/00*
U.S. Cl. 254—186 **2 Claims**



A power-operated winch assembly with multiple power-driven pinion gears meshing with an driving a drive gear coaxial with the winch drum in the assembly. Each of the pinion gears is coupled to a reversible hydraulic motor. The hydraulic motors may be placed in series with each other, to obtain high speed type of operation, and in parallel with each other, to obtain a high torque type of operation.

3,698,691
FENCE BARB ARM
Thomas W. Brown, 4104 S. Creek Road East, Chattanooga, Tenn.
Filed June 16, 1971, Ser. No. 153,731
Int. Cl. E04h *17/06*
U.S. Cl. 256—11 **2 Claims**

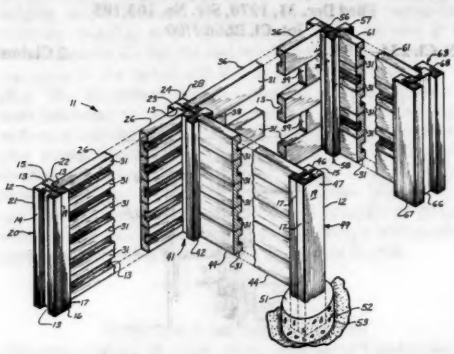


A Y-shaped barbed wire holder for attachment to the top of fence posts by means of an integral base which fits over the post. One barb arm and one half of the base if formed from from a single piece of sheet metal. The other half of the base is welded in place and an end closing disc is held in the base by an annular groove. The second barb arm is welded to the bight of the first arm.

3,698,692
MODULAR FENCE CONSTRUCTION
Clinton A. Burrows, Jr., 4441 Rand Lane, Sacramento, Calif.
Filed April 26, 1971, Ser. No. 137,236
Int. Cl. E04h *17/14*
U.S. Cl. 256—19 **9 Claims**

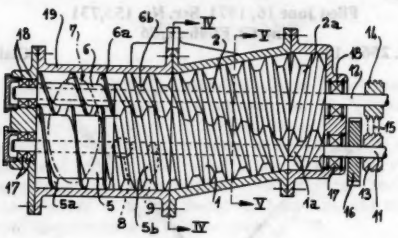
A channel member is C-shaped in cross section and has a length, width and thickness bearing a predetermined relation with respect to the width and depth of the elongated slot on one face of the channel. The slot width and depth is such that the channel can be used both as fence post and as a fence rail

with the post and rail in interlocking relation. Various orientations of the vertical fence posts provide L-shaped and T-shaped corners, and by arranging the horizontal rails so that



the slots face in suitable directions a variety of rail patterns can be formed. Spacers between adjacent rails afford an open, or corral-type, of fence and, if desired, the channel members can also be used to form a trim cap along the top of the fence.

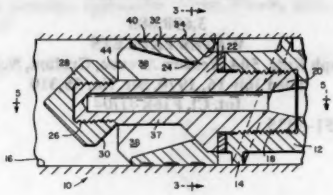
3,698,693
SCREW MIXERS
Pierre Poncet, 12 Bis rue Trarieux, Lyon, France
Filed July 26, 1971, Ser. No. 165,888
Int. Cl. B01f *7/00*
U.S. Cl. 259—5 **7 Claims**



A screw mixer comprises pairs of conical screws, the screws of each pair being of opposed conicity, closely intermeshing each other and rotating in the same direction (i.e. with their threads moving in opposed direction in the intermeshing zone). The material is thus transferred from one screw to the other one and the threads of a screw have a rubbing cleaning action on those of the other screw. In a modification the threads have a substantial axial clearance and the screws are axially oscillated with respect to each other in order that the outer edge or tip of the relatively narrow plain portions or ribs of the threads of each screw of a pair may scrape the flat bottom of the relatively wide depressions or void spaces which separate the ribs of the threads of the other screw.

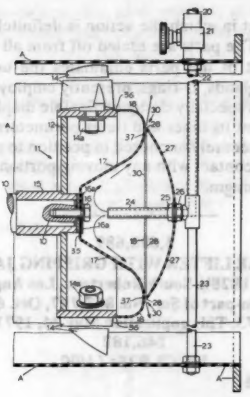
3,698,694
INJECTION APPARATUS
Hubert Zeug, Kosakenberg, and Friedrich Koch, Feldstrabe, both of Germany, assignors to Desma-Werke G.m.b.H., Uesen near Breman, Germany
Filed June 29, 1971, Ser. No. 157,977
Claims priority, application Germany, July 7, 1970, P 20 33 548.2
Int. Cl. B01f *7/08*
U.S. Cl. 259—191 **11 Claims**

An injection apparatus of the kind embodying a screw reciprocably mounted in a chamber by means of which a plasticizable material is plasticized and advanced along the chamber and then ejected at the forward end thereof; characterized in that there is a device associated with the head of the



screw operable to prevent reverse flow of the plasticized material during the forward movement of the screw when effecting ejection.

3,698,695
SPRAY GENERATOR
John S. Andrews, Glamorganshire, Wales, assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed Dec. 28, 1970, Ser. No. 101,857
Claims priority, application Great Britain, April 25, 1970, 20,004/70
Int. Cl. B01f *3/04*
U.S. Cl. 261—24 **4 Claims**

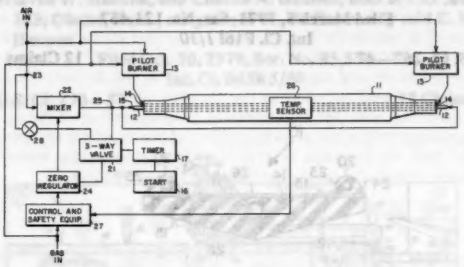


A spray or mist generator produces a controllable moisture content stream of gas by combining a fluid distributing component with a gas moving component in a duct.

3,698,696
COMBUSTION MIXTURE CONTROL SYSTEM FOR CALENDERS
Fred W. Rauskolb, Haworth, N.J., assignor to Standard International Corporation, Andover, Mass.
Filed June 14, 1971, Ser. No. 152,633
Int. Cl. F26b *13/18*
U.S. Cl. 263—6 C **7 Claims**

A combustion mixture control system for heated rolls used in calenders and embossers. This system employs a technique for sampling the air pressure and the combustion mixture pressure in conjunction with the use of a discrete timer for control of a fuel zero regulator to thereby control the com-

position of the combustion mixture applied to the calender roll burner. By thus controlling the amount of fuel in the



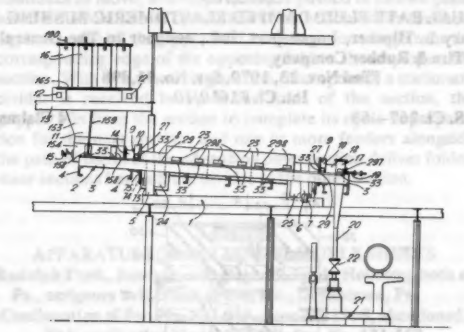
fuel/air mixture greater efficiency of operation is achieved and resonant noise often associated with initial heating is abated.

3,698,697

ROTARY KILNS

George Marshall Gillies, St. Annes, and James Edgar Littlechild, Lytham, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed April 9, 1971, Ser. No. 32,649
Claims priority, application Great Britain, April 23, 1970, 19,664/70; May 11, 1970, 22,749/70
Int. Cl. F27b 7/20
U.S. Cl. 263—32 R 8 Claims



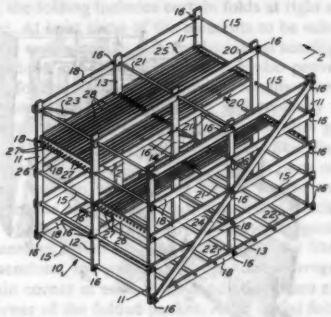
A rotary kiln comprises an inclined kiln barrel mounted on a supporting framework by upper and lower bearing members at the ends of the kiln barrel. The supporting framework is fitted with longitudinal bed plates and the upper and lower bearing members for the kiln barrel have support brackets which are fitted with bearing pads sealing on the bed plates through intermediate support members which lie in longitudinal grooves in the bed plates below the bearing pads of the support brackets for the bearing members. In the case of the lower bearing member the intermediate support members are in the form of rods lying in the longitudinal grooves of the bed plates below the bearing pads of the support brackets which are rigidly bolted to the bed plates. In the case of the upper bearing member the intermediate support members take the form of ball bearings running in the longitudinal grooves of the bed plates below the bearing pads of the support brackets. Thus the upper bearing member is free to move longitudinally with respect to the bed plates to accommodate for longitudinal thermal expansion of the kiln barrel. An inlet hopper is similarly mounted on the bed plates at the upper end of the kiln barrel by a movable support bracket at its other end. The inlet hopper connects with the kiln barrel through a slidable sealing means to accommodate for relative thermal expansion between the inlet hopper and the kiln barrel.

3,698,698

FIXTURÉ FOR HEAT TREATING FURNACES

Benjamin A. Kreider, Richboro; Charles J. Schmidt, Philadelphia, and Howard R. Martindell, Ivyland, all of Pa., assignors to Abar Corporation, Feasterville, Pa.

Filed Feb. 16, 1971, Ser. No. 114,937
Int. Cl. F27b 21/04
U.S. Cl. 263—47 R 5 Claims



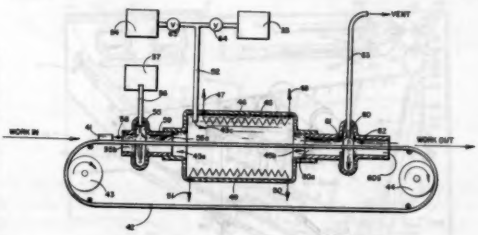
A fixture for heat treating furnaces is disclosed having a frame composed of upright bars, horizontal and diagonal bars and horizontal rods held is assembled relation by wires, of low fixture mass, the bars, rods and wires preferably being of low specific heat material, and preferably of molybdenum but alternatively of tungsten, tantalum, columbium and their alloys or of graphite, with an associated rack of the same material having horizontal ceramic tubes to support the articles to be heat treated in the furnace.

3,698,699

HOT GAS FUSION PROCESS AND APPARATUS

Julius H. Bochinski, La Habra, and John E. Linkel, Orange County, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 29, 1970, Ser. No. 85,047
Int. Cl. C21d 1/00
U.S. Cl. 266—5 R 3 Claims



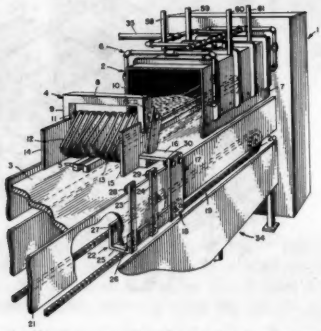
A hydrazine compound in a carrier gas wherein the hydrazine compound is transformed into its gaseous state and the gaseous hydrazine is used by processing apparatus to bond metallic materials with a soldering material, to remove film compound formation from metallic surfaces, and to minimize porous formation in soldering materials which may be attached to metallic surfaces. The hydrazine compound is transported by the gaseous carrier and heated to a temperature that vaporizes the hydrazine and is used for reacting the gaseous hydrazine with the film formation on the metals or with the soldering material thereon to achieve excellent bonding characteristics and low conductivity joints.

3,698,700

QUENCHING APPARATUS FOR EXTRUDED ARTICLES

Kurt F. Ziehm, Jr., Lantana, Fla., and James E. Markiewicz, Roselle, Ill., assignors to Precision Extrusions, Inc., Bensenville, Ill.

Filed Dec. 8, 1970, Ser. No. 96,119
Int. Cl. C21d 1/62
U.S. Cl. 266—6 S 6 Claims



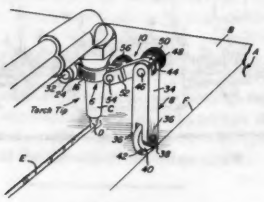
An apparatus for quenching elongated extruded metal products is provided in which the metal products are extruded directly into an elongated open ended, open bottom enclosure in which a wall of coolant is formed and wherein the construction is such that a puller for said elongated extruded metal products can engage the end of such products immediately adjacent the extrusion die and can move through said enclosure while maintaining a seal for preventing escape of the coolant during such movement.

3,698,701

CUTTING TORCH TIP GUIDE

Richard K. Straub, Beaver Falls, Pa., assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 31, 1970, Ser. No. 103,138
Int. Cl. B23k 7/10
U.S. Cl. 266—23 M 7 Claims



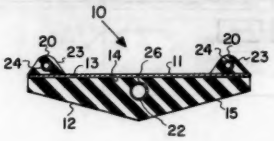
For detachable and adjustable use on and in conjunction with a commonly used tapered nozzle type torch tip, a tip supporting, lifting, lowering, and angling flame focusing self-contained guide attachment. This attachment comprises three principal component parts; namely, an adjustable collar-like tip encircling adapter, a complemental leg having a freely turnable work surface contacting wheel or disk mounted on its lower end; and a link having an inner end pivoted to said adapter and an outer end pivotally and operatively linked to an oriented upper end of said leg.

3,698,702

COMPOSITE LEAF SPRING

Merril G. Beck, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed March 5, 1971, Ser. No. 121,457
Int. Cl. F16f 1/30
U.S. Cl. 267—47 12 Claims



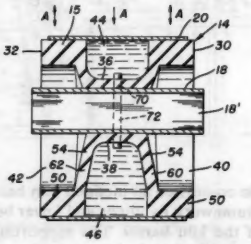
A composite leaf spring formed of two superimposed spring leaves. One of the spring leaves is a tensile member and the other is a compressive member. The tensile member is an elongate leaf formed of a flexible nonextensible material such as metal, fiberglass, fabric, etc. and the compressive member is an elastomer leaf adhered, preferably by bonding, in contiguous superimposed relation to the nonextensible leaf. The neutral axis in flexure of the composite leaf spring is preferably located either at the interface of the nonextensible and elastomer leaf or in the nonextensible leaf whereby upon flexure, only compressive stresses are introduced into the elastomer leaf.

3,698,703

DUAL RATE FLUID DAMPED ELASTOMERIC BUSHING

Gary L. Hipsher, Logansport, Ind., assignor to The General Tire & Rubber Company

Filed Nov. 23, 1970, Ser. No. 91,898
Int. Cl. F16f 9/10
U.S. Cl. 267—63 4 Claims



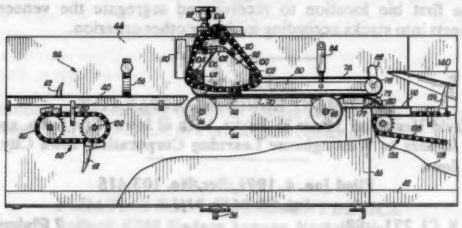
A fluid damped bushing comprises an annular rubber insert radially compressed between a pair of rigid sleeves. The curved outer surface of the insert contains a pair of radially spaced voids which co-operate with the outer sleeve to form enclosed pockets. These pockets are interconnected and are filled with a suitable fluid to provide the bushing with high damping characteristics in the radial direction through the pockets. The generally parallel and planar ends of the insert are voided around the inner sleeve to form suitable recesses. The recesses are separated from the fluid pockets by relatively thin webs which flex rather than undergo compression to provide a very low spring rate in the direction through the fluid. The radial spring rate at right angles to the pockets is considerably higher and may be as much as five times as great as the spring rate through the pockets. The inner sleeve is preferably shaped to give a highly planar surface in the direction of a high spring rate. The bushing can be used, for example, as a vibration isolator between an engine and the frame of a vehicle.

3,698,704

FOLDED NEWSPAPER OPENING MECHANISM FOR MULTIPLE SECTION INSERTING MACHINE

Warren W. Hannon, and Charles N. Hannon, both of P.O. Box 103, Olathe, Kans., assignors to W. W. Hannon by said C. N. Hannon

Filed Oct. 30, 1970, Ser. No. 85,534
Int. Cl. B65h 5/30
U.S. Cl. 270—57 12 Claims



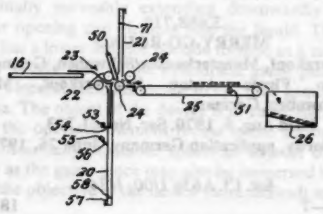
A machine for assembling a multiple section newspaper successively feeds folded outer sections onto a continuously moving conveyor for advancement beneath mechanical opening mechanism with the fold line of the section disposed to one side and the hard edges thereof leading. As each outer section passes beneath the opening mechanism, a gripper thereof cycling in a generally upright plane moves down into frictional engagement with the outer leaf of the moving section and then obliquely across the path of travel of the section as the latter continues to move, whereby the leaf is pushed in its own plane toward the fold line of the section. This action draws the leading hard edge of the upper fold of the section away from the corresponding edge of the opposing fold to thereby open the section. With the advancing section thus opened, a stationary divider is received between the folds of the section, the gripper lifts from the section to complete its cycle in preparation for the next section, and one or more feeders alongside the path of travel of the advancing outer section deliver folded inner sections beneath the divider to the outer section.

3,698,705

APPARATUS FOR FOLDING FLEXIBLE SHEETS

Rudolph Funk, Jamison, and Roger S. Funk, Holicong, both of Pa., assignors to R. Funk & Co., Inc., Doylestown, Pa.

Continuation of Ser. No. 737,934, June 18, 1968, abandoned. This application March 5, 1971, Ser. No. 121,568
Int. Cl. B65h 45/12, 45/18
U.S. Cl. 270—62 21 Claims



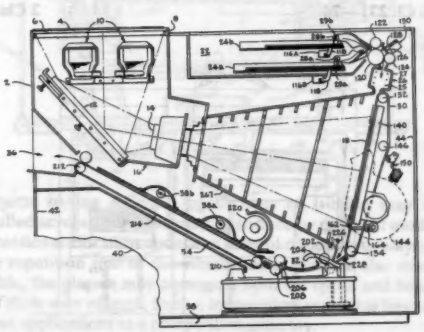
Apparatus which handles flexible sheets, typically blueprints or the like, for folding them, is adapted to handle sheets, not only of uniform size but also an intermix of sheets of differing sizes, and to fold them selectively, along one or more fold lines, each into a folded packet having perdetermined standardized length and width dimensions; and the apparatus comprises high-speed normally continuously-operating sheet transport means with associated sheet-folding mechanism having a plurality of elements adapted to cooperate in the folding operation, at least some of the elements being selectively rendered operative according to sheet size whereby to fold the sheet on one or more lines of fold so related as to form the sheet into a folded packet of the predetermined standardized dimensions, regardless of the initial size of the sheet; there being a programming system for such selectively operative elements, controllable, in accordance with sheet size, to select simultaneously the required group of said elements, without retarding the sheet transport means or interfering with the normal flow of work through the apparatus. Above certain sheet sizes, the folding includes certain folds at right angles to one another. At least some of the elements to be selected for operation are automatically selected by means sensing certain sheet dimensions, but manual operation is also provided for, as to certain folding functions, by devices readily accessible to and quickly actuable by an operator, and typically the programming system includes an electrical mechanism governed at least in part by interlocking switches, or the like, disposed in a removable and replaceable console. Certain parts of the apparatus may function as transport means and/or as folding means. Regardless of the number, direction and spacing of the folds, and whether or not the initial sheet configuration involves dimensions which are even multiples of the final folded packet dimensions, the packet has no external irregularities; and a certain corner of each sheet handled appears at a given external corner of the folded packet. After initial folding, the sheet, depending upon its original size, may be discharged into a receiver from a particular station, or it may be arrested at that station, without stopping the transport means, and then given one or more additional folds and transported from that station to a different receiver. Power means for the apparatus may normally operate continuously, but may be interrupted at will, and a jogging operation and/or a manual operation may be introduced.

3,698,706

ELECTROSTATIC PRINTER

Steven Mihojevich, Northbrook; Arthur S. Zerfass, Elk Grove; Ralph G. Ostensen, Morton Grove; Albin F. Berggren, Jr., Des Plaines, and Ronald A. Glaser, Arlington Hts., all of Ill., assignors to SCM Corporation

Continuation of Ser. No. 821,517, Oct. 7, 1968, abandoned, which is a division of Ser. No. 463,071, June 11, 1965, Pat. No. 3,416,860. This application Feb. 24, 1971, Ser. No. 118,486
Int. Cl. B65h 5/02
U.S. Cl. 271—9 10 Claims



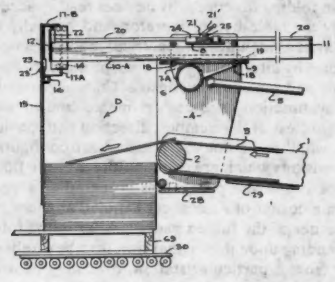
An electrostatic printing machine having an exposure station and an imaging station, and having copy sheet supply means for the storage of photoductive copy sheets, means for moving a copy sheet from said supply means and past the imaging station, and vacuum means for holding the copy sheet at the image station. The machine includes stop means for uncoupling drive means, and brake means for stopping the movement of the means for moving the copy sheet past the imaging station. The machine also has a plurality of copy

paper sheet magazines from which copy sheets may be selectively supplied.

3,698,707
SHEET STACKER AND CONTROL STACK REMOVING MEANS

Raymond L. R. Lucas, Avenue de la Republique, Prechac, France

Filed Nov. 30, 1970, Ser. No. 93,747
Claims priority, application France, Dec. 22, 1969, 6944504
Int. Cl. B65h *29/50*
U.S. Cl. 271—68 **6 Claims**

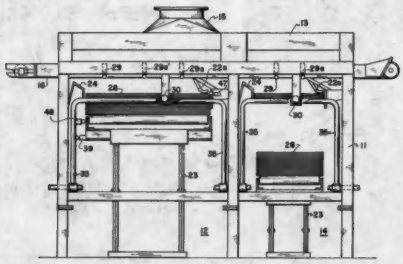


A sheet conveyor is provided for depositing sheets onto a stack with the conveyor discharging end being moved progressively upward as the stack height increases with a stop plate being positioned forward of the discharge end of the conveyor and mounted on adjustable horizontally movable arms for adjustment to the size of the sheet being stacked with the sheets being deposited on a reversible power driven conveyor and safety contact switch means being provided on the sheet conveyor and with control switch means on the discharge side of the stop plate for enabling a close spacing of successively formed sheet stacks.

3,698,708
VENEER STACKER

Philip E. Brawn, Springfield, Oreg., assignor to Carothers Sheet Metal Company, Eugene, Oreg.

Filed Jan. 18, 1971, Ser. No. 107,319
Int. Cl. B65h *29/32*
U.S. Cl. 271—74 **2 Claims**

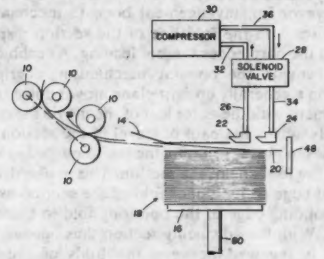


Apparatus for sorting and stacking veneer sheets comprising a vacuum infeed conveyor transporting individual sheets of veneer width-wise to a position above a scissors lift table whereupon parallel-motion knockdown arms are actuated to force the sheet loose from the vacuum conveyor and down onto the top of a pile forming on the lift. Squaring of the pile of sheets into a uniform stack is accomplished by the knockdown arms which move the forward lateral edge of the sheet up against a fixed stop acting in conjunction with a pair of actuatable even-ender pusher arms which align the longitudinal edges of the sheet. When a predetermined pile height is reached, as determined by the downward indexing of the scissors lift, the completed pile is discharged from the apparatus by an outfeed conveyor. While the pile is being discharged a pair of accumulator members are moved into position beneath the knockdown arms so as to temporarily support and retain the initial several sheets of a new pile as the scissors lift is discharged and recycled to the position where it is ready to receive the new pile in formation. A modification of the apparatus provides one or more additional bin locations adjacent the first bin location to receive and segregate the veneer sheets into stacks according to size or other criterion.

3,698,709
DOCUMENT HANDLING APPARATUS

David Heal, and James D. Parks, both of Iowa City, Iowa, assignors to Westinghouse Learning Corporation, Iowa City, Iowa

Filed Jan. 4, 1971, Ser. No. 103,415
Int. Cl. B65h *31/10*
U.S. Cl. 271—88 **7 Claims**



A system for offsetting the position of a selected document in a stack of similar documents as the selected document is fed into the stack. The system can be used in any apparatus where documents are serially conveyed into a stack forming mechanism for the purpose of identifying the offset document from others in the stack. The apparatus uses vacuum shoes to stop the documents in either the offset or a normal stack position, the former being used for those documents selected for identification. The vacuum shoes are also used as a stack height sensing means to control the customary vertically movable table supporting the stack.

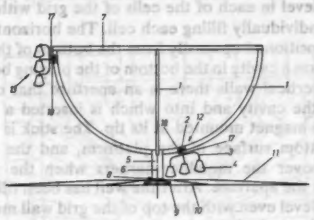
3,698,710
MERRY-GO-ROUND

Anton Schwarzkopf, Munsterhausen/Schwaben, Germany, assignor to Firma Anton Schwarzkopf, Munsterhausen/Schwaben, Germany

Filed Aug. 5, 1970, Ser. No. 61,233
Claims priority, application Germany, June 26, 1970, P 20 31 547.3
Int. Cl. A63g *1/00, 1/34*
U.S. Cl. 272—7 **18 Claims**

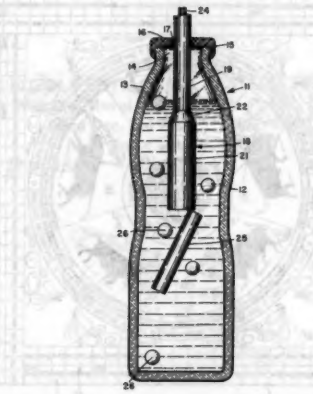
A merry-go-round has a hemispherical framework or cage rotatable about a vertical axis, the framework including a plurality of curved beams of quadrantal shape extending from a common hub at the nadir of the hemisphere to its equator defined by a circular hoop; each beam forms a guidetrack for a respective trolley having several passenger cabins suspended therefrom by universal joints. The trolleys are hoisted along their tracks, during a ride, by chains or the like which in one embodiment are controlled by a piston slidable under air pressure in the hollow beam. The framework may surround a

sphere bearing a simulated moonscape, the cabins simulating space craft on a lunar mission. A method is also disclosed of



erecting and collapsing the lunar sphere step-by-step with application of air pressure to a telescoped center post.

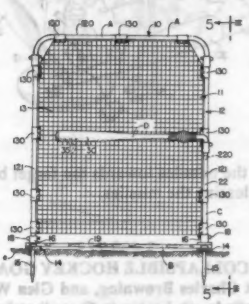
3,698,711
FLOATING BODY AMUSEMENT DEVICE
Terry S. Bullard, 6268 Hudson Avenue, Norfolk, Va.
Filed Sept. 7, 1971, Ser. No. 178,091
Int. Cl. A63f 9/06
U.S. Cl. 273—1 L **10 Claims**



An amusement device including a transparent container substantially filled with a liquid having a cylindrical game piece immersed therein tending to float towards the upper surface thereof, and a tubular operator element operationally longitudinally moveably extending downwardly through a container opening cap element into the liquid. The operator element has a lower interior portion formed as a recess to substantially snugly receive the cylindrical game piece, and the operator element includes means to eject the game piece from the recess. The object of the device is to cause the game piece to enter the operator element recess in the shortest possible time. Substantially floatable spherical objects of the same diameter as the game piece may also be immersed in the liquid to make the objective of the device more difficult to attain.

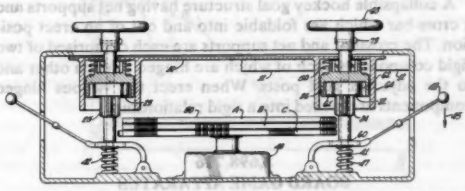
3,698,712
BASEBALL PITCHING PRACTICE DEVICE
Vincent C. Pero, 18011 Greenfield, Detroit, Mich.
Filed Aug. 25, 1971, Ser. No. 174,656
Int. Cl. A63b 69/40
U.S. Cl. 273—26 A **4 Claims**

A readily portable easily erected and dismantled baseball pitching practice device or game including a backstop frame and net, the said frame being supported vertically on a pair of laterally spaced transverse base elements, one said base element supporting a vertically disposed stanchion spaced forwardly from said net frame onto which it is braced. A light weight hollow plastic bat is removably spring-mounted on said stanchion extending laterally therefrom parallel to but spaced forwardly of said backstop net holding said bat resiliently lateral from said stanchion at the height of the normal swing of a baseball player when at bat. The said bat normally carries in the outer ball hitting portion thereof one or more noise mak-



ing devices which become audible responsive to the bat being hit by a pitched ball. The more direct the outer ball hitting portion of the bat is hit by a pitched ball, the more loud and distinct the audible response whereby the pitcher readily determines audibly when the bat is hit squarely at its ball hitting end portion, or near its handle, or merely "ticked" by a near miss. The extent to which the bat swings or oscillates after being hit by a pitched ball also is visually indicative of the accuracy of the pitch.

3,698,713
GAMETOY LOCOMOTION APPARATUS
Bruce D. Jimerson, 1815 Vallecito Drive, San Pedro, Calif.
Filed June 18, 1970, Ser. No. 47,549
Int. Cl. A63f 9/14
U.S. Cl. 273—86 E **9 Claims**

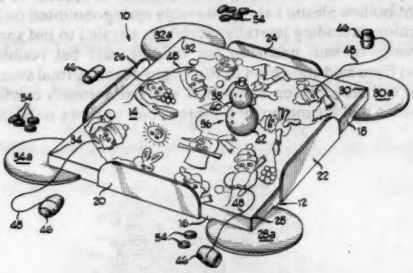


Objects having different coefficients of friction may be propelled across a common playing surface by different modes of directional vibration under the control of opposing players. If the repetition rate of the vibrational modes are also made variable, the players may command both the speed and heading of their own objects. Such a locomotion apparatus has numerous applications as a competitive gametoy.

3,698,714
PROJECTILE DISPLACING APPARATUS INCLUDING STRESSIBLE STRANDS AND MISSILES
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates
Filed Feb. 25, 1971, Ser. No. 118,858
Int. Cl. A63d 3/02
U.S. Cl. 273—119 R **3 Claims**

A missile-launching game of the type having a game board,

a weighted target member resting on the game board and missile members connected to the game board by elastic strands

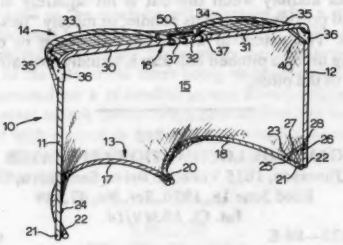


for launching the missiles towards the target by stretching the strands and releasing the missiles.

3,698,715
COLLAPSIBLE HOCKEY GOAL

Stanley Albert Charles Browning, and Glen Williams, both of Ontario, Canada, assignors to Canadian Imperial Bank of Commerce, Toronto, Ontario, Canada

Filed March 26, 1970, Ser. No. 22,827
Int. Cl. A63b *63/00, 71/00*
U.S. Cl. 273—127 B **2 Claims**

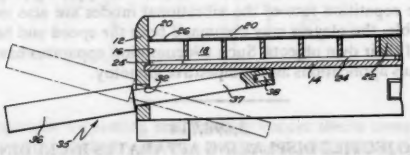


A collapsible hockey goal structure having net supports and a cross-bar which are foldable into and out of an erect position. The crossbar and net supports are each comprised of two rigid components each of which are hinged to each other and to the adjacent goal posts. When erect the various hinged components are locked into a rigid relationship.

3,698,716
BOARD GAME APPARATUS

Wilfred H. Rattey, Jr., 1 Laurel Lane, Cumberland, R.I.

Filed Feb. 1, 1971, Ser. No. 111,492
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AE **5 Claims**

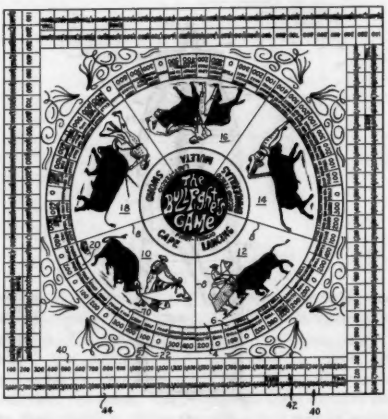


A game apparatus having a game board with four vertical walls and a substantially horizontal platform spaced downwardly from the top of said walls and attached thereto to form a well into which water is poured. The grid within said well has its open network vertically oriented with the vertical height of the walls of the grid being less than the depth of said well. A plurality of spacers in the bottom of the well maintain the bottom surface of the grid in a spaced relationship from the bottom of the well and allows water poured into the well to seek its own level in each of the cells of the grid without the necessity of individually filling each cell. The horizontal platform is also positioned upwardly from the bottom of the vertical walls to form a cavity in the bottom of the playing board. In each of the vertical walls there is an aperture that communicates with the cavity and into which is inserted a playing stick having a magnet mounted at its tip. The stick is used to strike the bottom surface of the platform, and the magnet serves to recover the metallic markers when the stick is removed from the aperture. After the well has been filled with water up to a level even with the top of the grid wall members, a water absorbent playing cover sheet is placed thereon. The playing piece markers are then positioned in their respective playing areas and the game is ready to be played.

3,698,717
GAME SIMULATING A BULLFIGHT

Luis Canizares, Calle Alfredo Galvez 319, Rio Piedras, P.R.

Filed June 1, 1971, Ser. No. 148,693
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AG **6 Claims**



A game to be played by two, three or four persons using a game board having a circular part which is divided into five sections representing the successive stages of a conventional bullfight, these being surrounded by a circle divided into segments corresponding respectively to the five sections and extending in circular sequence from a start position, and to which each player advances his game piece in accordance with the total of numbers on thrown dice. A number of decks of cards are provided, each of which corresponds to one of the five sections, and a player may take a card from the appropriate deck when allowed to do so by the rules of the game, and must then move or act in accordance with the benefit or penalty shown by the card. Four numbered scales are provided on the game board on each of which one of the players moves a score piece to indicate his cumulative score.

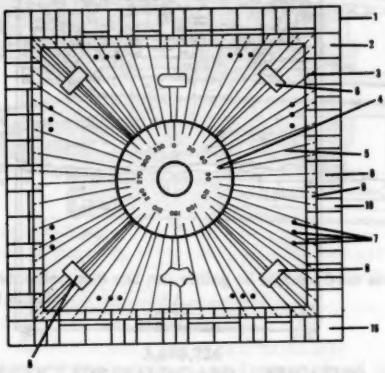
3,698,718
BOARD TYPE GAME

Byron D. Kuhn, 642-A Chester Street, Norfolk, Va.

Filed June 2, 1969, Ser. No. 829,502
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 B **2 Claims**

Game apparatus comprising a game board having two parallel player courses extending around the periphery thereof, a

compass rose freely rotatably mounted centrally of the board, and slots formed in the peripheral edges of the board for receiving removable inserts which bear indicia relating to the game. The apparatus further comprises cards which are drawn



by players who land on specially marked areas of the player courses, and peg holes are formed in the board for receiving pegs used to keep track of turns to be lost as the result of penalties.

3,698,719

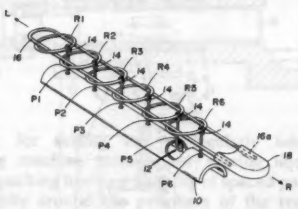
RING PUZZLE WITH QUICK RESTORATION MEANS

Louis M. Winslow, Rural Route 2, Belle Plaine,, Iowa

Filed Dec. 2, 1970, Ser. No. 94,507

Int. Cl. A63f *9/08*

U.S. Cl. 273—158 **4 Claims**



Disclosed is a puzzle of the type having a plurality of rings and posts with an elongated, closed loop threaded therethrough, the object of the puzzle being to remove the loop by an elaborate and lengthy sequence of manipulations of the rings and the loop. In order to be able easily to obviate mistakes in the solution of the puzzle or to replace the loop once it has been removed, the loop is formed with a removable portion so that it can be forthwith withdrawn and quickly rethreaded through the rings and posts.

3,698,720

GOLF BALL RETRIEVER

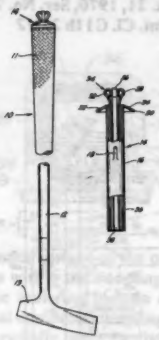
Austin Gudmundsen, 2016A Via Mariposa Way, Laguna Hills, Calif.

Filed Jan. 20, 1971, Ser. No. 107,995

Int. Cl. A63b *57/00*

U.S. Cl. 273—162 E **16 Claims**

A golf ball retriever comprising a cylindrical cartridge and a tine assembly being retained in the cartridge during non-use and being extended from the cartridge for use is disclosed. The tips of the tines in the retracted position form a crown which is easily gripped by the user for extending the tine assembly. The tines are generally arcuatly formed and composed of a resilient material so as to expand while being extended such that the tips of the tines slip easily about a golf ball for gripping the golf ball. Dimensions and the materials are important.



3,698,721

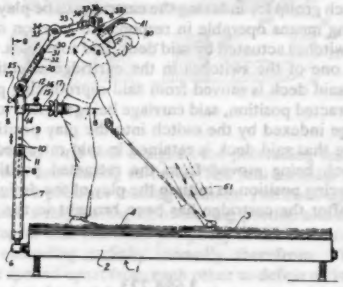
GOLF PRACTICE DEVICE

Albert A. Stewart, 150 Fox Meadow Road, Scarsdale, N.Y.

Filed Nov. 25, 1970, Ser. No. 92,577

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 C **7 Claims**



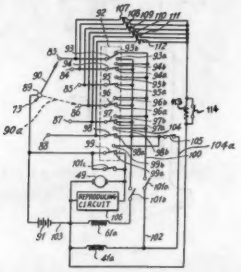
A golf practice device includes adjustable, extensible members for engaging and controlling the movement of a golfer's head and hips without interfering with motion of arms and shoulders during a swing, and includes adjustable, flexible guide members which define a correct path of swing, and provide an indication of error when the correct path of swing is not followed. The head movement control members comprise a pair of resiliently mounted padded guides which engage the golfer's cheeks and permit limited but yieldingly restrained turning movement of the golfer's head. The hip movement control members comprise a pair of curved hip guides which extend through less than a half circle and terminate at the golfer's hip joints. The golf club swing guide members are carried by brackets which are adjustably mounted on horizontal bars supported by vertical rods. The various components may be used with a platform which is adapted to tilt very slightly to give the golfer an indication of the instant when his weight shifts from one foot to the other.

3,698,722

CONTROL CIRCUIT FOR MULTIPLE TAPE CARTRIDGE PLAYING APPARATUS

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 73,889
Int. Cl. G11b *23/12*
U.S. Cl. 274—4 F **4 Claims**



The multiple tape cartridge playing apparatus comprises a rotatable carriage on which a plurality of endless magnetic tape cartridges mounted and which is rotatably driven to selectively bring one of the cartridges into the play position, a reciprocally movable deck provided with a rotary capstan and a magnetic head for playing the cartridge brought into the play position, and deck driving means for moving the deck between a reproducing position where the capstan and the magnetic head engage the cartridge in the play position and a reproducing position where the capstan and the magnetic head are disengaged from the cartridge. A control circuit for the multiple tape cartridge playing apparatus comprises a cartridge selecting switch group for indexing the cartridge to be played, rotary switching means operable in response to rotation of the carriage, switches actuated by said deck, and solenoids. By operation of one of the switches in the cartridge selecting switch group, said deck is moved from said reproducing position to said retracted position, said carriage being rotated to bring the cartridge indexed by the switch into the play position during the time that said deck is retained in said retracted position, said deck being moved from the retracted position to the reproducing position to initiate the play of the designated cartridge after the cartridge has been brought to the play position.

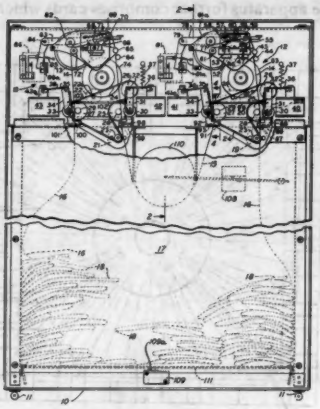
3,698,723

ENDLESS LOOP TAPE RECORDER

Richard Kobler, Zug, Switzerland, and William F. Fagan, Rochelle Park, N.J., assignors to McGraw-Edison Company, Elgin, Ill.

Filed March 9, 1971, Ser. No. 122,349
Int. Cl. G11b *15/29, 23/12*
U.S. Cl. 274—4 R **17 Claims**

A combined dictating and transcribing machine uses an endless magnetic tape of a length sufficient for several hours recording. The machine — herein referred to as an "endless tape recorder" — comprises separate dictating and transcribing units with independent tape driving mechanisms and a single storage bin or tank below these units to receive the inner and outer runs of the tape. Each run may comprise multitudinous loops folded back and forth on itself. A tank vibrator serves to overcome friction and static effects to keep the tape loops settled in the storage bin. A safety drive control and warning system comprises a first switch operated when the inner run is drawn taut and a second switch operated when the outer run is tensioned. A feature of the invention is that as the outer run is tensioned it will pick up the looped mass or bundle of the tape then constituting the inner run to operate the



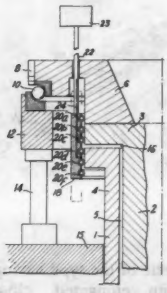
second safety switch and that when it has lifted the bundle to the top of the storage bin it operates also the first safety switch.

3,698,724

SEALING DEVICE

Robert Blachere, Meyrargues, and Michel Sauvage, Aix-en-Provence, both of France, assignors to Commissariat A L'Engergie Alomique, Paris, France

Filed Nov. 12, 1969, Ser. No. 875,623
Int. Cl. F16j *15/46*; G27b *33/00*
U.S. Cl. 277—34.3 **6 Claims**



The sealing device particularly adapted to provide a pressure-tight passageway for rotating or sliding parts, comprises inflatable seals which can be easily replaced without any interruption of leak thightness. The inflatable seals are each placed in a groove of a rigid support which can be displaced longitudinally between different positions in each of which at least one seal is in contact with each part and one other is freed and can be replaced.

3,698,725

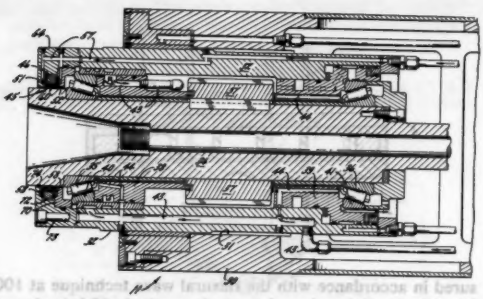
HYDROSTATIC SEAL FOR ROTARY MACHINE TOOL SPINDLES

Steven Eldor Klabunde, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Jan. 13, 1971, Ser. No. 106,156
Int. Cl. B65d *53/00*; F15j *15/16*; F16j *15/34*
U.S. Cl. 277—74 **13 Claims**

A hydrostatic seal is provided for machine tool headstocks having rotary, or rotary and translatable, tool spindles. A pres-

surized air film is formed between opposite sides of a thrust ring and adjacent hydrostatic seal bearings, forming a substantially frictionless seal and preventing oil leakage from around the tool spindle.

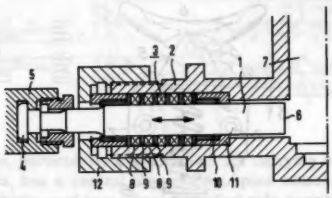


3,698,726

DEVICE FOR SEALING AND LUBRICATING RECIPROCATING MACHINE MEMBERS

Kurt Schettler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Munchen, Germany

Filed Oct. 8, 1970, Ser. No. 79,009
Int. Cl. K16j *15/18*
Claims priority, application Germany, Aug. 6, 1970, P 20 39 071.0
U.S. Cl. 277—125 **4 Claims**



A device for sealing and molecularly lubricating a reciprocating machine member for moving liquids has a stuffing box packing having a plurality of spaced packing rings disposed tightly around the periphery of the reciprocating machine member and is comprised of polytetrafluoroethylene and a fiber mesh. Also provided are a plurality of intermediate rings made of textile mesh hardened with synthetic resin and disposed around the member. Each of these intermediate rings is positioned between a pair of next-adjacent packing rings and has an inner surface bordering the member. The inner surface of each of the intermediate rings is provided with an annular groove. A slit-like passage extends laterally through the respective packing rings for accommodating a flow of the liquid moved by the member, whereby the groove of each of the intermediate rings fills with the liquid for providing a continuous lubrication of the member.

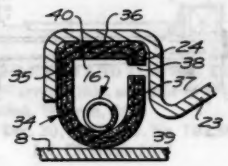
3,698,727

DISTORTABLE SEAL RING

Fred A. Greenwald, South Gate, Calif., assignor to General Connectors Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 789,669, Jan. 8, 1969, abandoned. This application May 17, 1971, Ser. No. 144,123
Int. Cl. F16j *15/32*
U.S. Cl. 277—153 **14 Claims**

A seal ring of essentially U-shaped or J-shaped cross section is intended to be interposed between a coupling having a radially inwardly directed wall and a conduit tube loosely received therein; wherein, the axially outer radial wall of the seal ring formed of elastomer impregnated laminations of fiber glass or similar material capable of axial distortion bears against the coupling end wall and is joined to a radially and axially inwardly curved conduit engaging a semitoroidal portion capable of axial as well as radial distortion, the interior of the seal ring including the inner surface of the outer radial wall, being exposed to pressure within the coupling and conduit. Certain embodiments of the seal ring include a core of elastomeric material or a toroidal compression spring or both, and one embodiment having a radially outer cap band separated by a slit from the axially inner side of the seal ring.

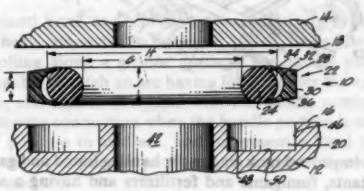


3,698,728

FLUID SEALING DEVICE

James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation

Continuation of Ser. No. 863,658, Oct. 3, 1969, abandoned. This application Jan. 7, 1971, Ser. No. 104,750
Int. Cl. F16j *15/10*
U.S. Cl. 277—165 **8 Claims**



An improved fluid seal designed for precluding leakage of fluid between two mating surfaces. The seal includes a back-up device and a pressure loading element. The back-up device is shaped like a ring having an outer ring portion and two side flanges integral with the inner periphery of the outer ring portion and extending radially inwardly therefrom. The side flanges are spaced apart from each other to define an inwardly facing annular channel for retaining the pressure loading element. The seal may be easily installed in a groove formed in one of the mating surfaces to prevent leakage.

3,698,729

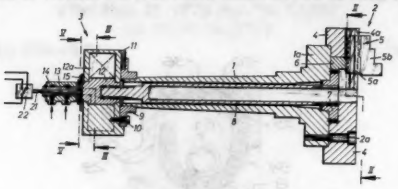
POWER OPERATED CLAMPING DEVICE FOR MACHINE TOOLS

Hans Scharfen, Buderich, and Josef Steinberger, Dusseldorf, both of Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed Feb. 17, 1971, Ser. No. 116,158
Claims priority, application Germany, Feb. 19, 1970, P 20 07 509.6
Int. Cl. B23b *31/16, 31/30*
U.S. Cl. 279—4 **6 Claims**

A power operated clamping device for machine tools in which a chuck body having radially moveable jaws is mounted on one end of a spindle while an oscillatory fluid motor is mounted on the other end of the spindle. Actuating blocks on the chuck body are connected to the motor and engage the

jaws and move the jaws positively when the motor is actuated. When the motor is turned beyond a certain limit, the blocks disengage from the jaws while simultaneously a control system is actuated to prevent rotation of the spindle.

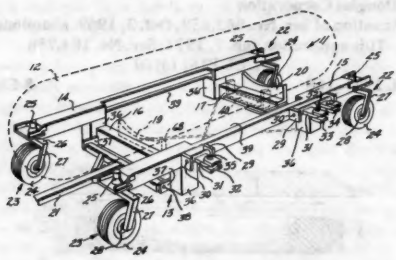


3,698,730

TANK WAGON

Clarence M. Hansen, East Lansing, Mich., assignor to Board of Trustees of Michigan State University, East Lansing, Mich.

Filed Sept. 10, 1970, Ser. No. 70,950
Int. Cl. B60p 3/22
U.S. Cl. 280—5 E **5 Claims**



An improved tank wagon for hauling liquid and gaseous soil injectants, fumigants and fertilizers and having a selectively resilient chassis-frame torsionally absorbing shock stresses without impairing the tank support and including caster type wheels journalled in the chassis so that the wagon can be offset from a gang plow or implement, for example, and can be towed in a canted attitude parallel to the line of tractor travel. The chassis is provided with adjustable side extending arms for adjusting the chassis to a moving attitude. Journalling means are provided in the chassis for the support casters and brakes are selectively lockable on each caster so that when the tank wagon is towed along a road, for example, the casters are deactivated or suppressed in their pivoting action to allow the towing of the wagon by a fast moving vehicle from its tow bar. The tank is supported fixedly at only one point so that the tank does not overly rigidify the chassis frame.

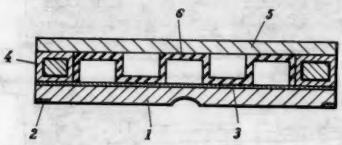
3,698,731

MULTILAYER SKI AND METHOD FOR THE FABRICATION THEREOF

Wolf-Dieter Jost, and Karl-Gunter Moritz, both of Oberosterreich, Austria, assignors to Semperit Osterreichisch-Amerikanische Gummwerke Aktiengesellschaft, Vienna, Austria

Filed Dec. 9, 1969, Ser. No. 883,519
Claims priority, application Austria, Dec. 11, 1968, A 12049/68; April 11, 1969, A 3519/69
Int. Cl. A63c 5/12
U.S. Cl. 280—11.13 L **26 Claims**

There is disclosed a multilayered ski construction which contains at least one strip-, band- or similar shaped insert member and/or support member formed of a preferably cross-linked, elastomeric plastic material, which possesses a relative dampening of at least 8 percent, preferably 10 percent (measured in accordance with the flexural wave technique at 100 Hz). The invention also relates to the method of fabrication of such ski or the like.

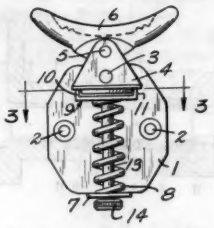


3,698,732

TOE IRON FOR SAFETY SKI BINDINGS

Bernd Payrhammer, 8105 Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed June 16, 1970, Ser. No. 46,759
Claims priority, application Germany, July 23, 1969, P 19 37 479.9
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **3 Claims**



A baseplate or an intermediate plate is provided with at least one vertical pivot pin. Said pivot pin or each of said pivot pins is provided with a pivoted member, which is pivotally movable on the respective pivot pin against the force of a spring and carries a soleholder member. Said spring is disposed in a plane that is parallel to the ski. The spring extends in the longitudinal direction of the ski when the toe iron is in normal position. The spring bears at one end on an abutment which is rigid with the baseplate or intermediate plate and at its other end cooperates by means of a bridge member with the pivoted member or pivoted members. The bridge member is rotatable about the axis of the spring and has two legs, which are diametrically opposite to each other and equally spaced from the axis of the spring and bear on the pivoted member or pivoted members.

3,698,733

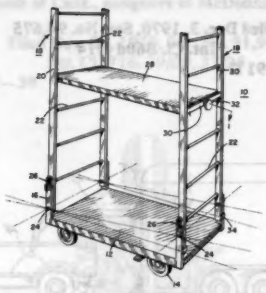
FREE STANDING FOLDABLE CART

Harold Isaacs, 2583 Fenwick Road, University Hts., Ohio

Filed April 22, 1971, Ser. No. 136,350
Int. Cl. B60p 9/00
U.S. Cl. 280—33.99 T **14 Claims**

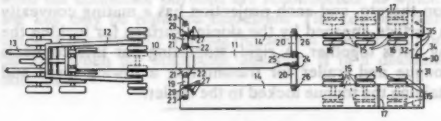
A free standing foldable cart having a rectangular base shelf with a post in each of the four corners and a pair of longitudinally spaced end frames. The posts of each end frame are pivotally connected to a corresponding post of the base shelf

for rotation of each end frame about a single axis of rotation to fold the end frames about the base shelf. In the folded posi-



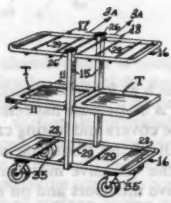
tion, two or more carts may be vertically stacked upon and moved about the running gear of the bottom cart.

3,698,734
TRAILERS
Colin Anthony Drake, Andrew Street, Rocklea, Brisbane, Australia
Filed Feb. 22, 1971, Ser. No. 117,641
Int. Cl. B62b *1/00*
U.S. Cl. 280—34 R **1 Claim**



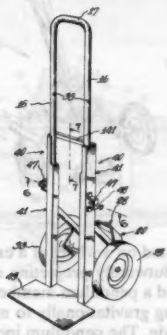
A trailer, particularly a semi-trailer for carrying heavy and wide loads, has a central longitudinal spine attachable to a towing vehicle, and two wheel-mounted side members, connected to either side of the spine by parallel-motion links and thus movable towards or from the spine, in parallelism, to narrow or widen the trailer. At the rear the side members are connected by a telescopic bumper bar with two slidably interfitted parts. The side members are held in laterally adjusted position relative to the spine by locking means associated with the parallel motion links and with the telescopic bumper bar.

3,698,735
UTILITY WHEEL-BEARING CARTS
Harold Bloomfield, and Melvin F. Roberts, both of Chicago, Ill., assignors to Bloomfield Industries, Inc., Chicago, Ill.
Filed March 8, 1971, Ser. No. 121,986
Int. Cl. B62b *3/00*
U.S. Cl. 280—47.35 **3 Claims**



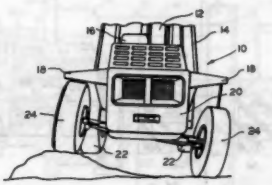
A utility wheel-bearing cart which is adapted for a wide range of uses including use in homes, restaurants, hospitals, motels, hotels, grocery stores, and the like, for transportation of various articles and merchandise, the cart comprising a plurality of horizontally disposed shelves supported in superimposed spaced relation with respect to each other, each shelf being supported at one end from a support and from which the shelf extends laterally in a horizontal plane from at least one side of the support.

3,698,736
COMBINED HAND AND TOWING TRUCKS
Robert C. Shape, Warren, Ohio, assignor to Warren Steel Specialties Corporation, Warren, Ohio
Filed Dec. 30, 1970, Ser. No. 102,598
Int. Cl. B62b *1/04*
U.S. Cl. 280—46 **5 Claims**



A combined hand and towing truck comprising a handle portion, wheels connected to the lower end of the handle portion for rolling along a ground surface, the handle portion being swingable through an arc having for its center the axis of the wheels, and means swingable with the handle portion to present a towing connection when the handle portion is in one throwover position in said arc, and to present a hand truck platform when the handle portion is in another throwover position in said arc.

3,698,737
VEHICLE SUSPENSION
Lewis F. Grant, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Nov. 12, 1970, Ser. No. 88,749
Int. Cl. B60g *11/02*
U.S. Cl. 280—112 R **9 Claims**



A vehicular spring suspension which includes a frame supported trunnion mounted support arm extending transversely of the vehicle and connected at its opposite ends to the one ends of a pair of parallel longitudinally extending leaf springs from which are supported an axle and wheels. The mounting for the support arm includes a spherical bearing mounted on a trunnion shaft of such length that the support arm is movable in three separate directions on the shaft, viz., in articulation in

a vertical plane, in articulation in a transverse of longitudinal plane, and axially of the shaft, as well as in various combinations of said three directions of movement depending upon the nature or type of irregularity of the terrain in which the vehicle is operated.

3,698,738

GOLF CART SEAT

Norman K. Bossert, 712 Alicante Drive, Lodi, Calif.

Filed July 14, 1971, Ser. No. 162,455
Int. Cl. A47b *13/02*; B60r *27/00*
U.S. Cl. 280—150 R 7 Claims

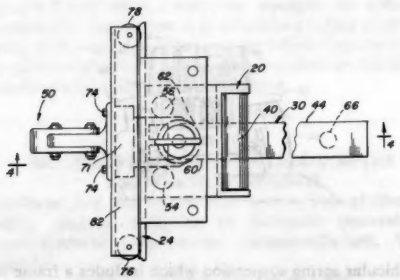
Coaxially mounted on a wheel of a cart used to carry a golfer's clubs is an outwardly projecting stub shaft on which is swingably mounted a pendulum member carrying on its lower end a mass tending gravitationally to maintain the pendulum in a vertical attitude. The pendulum includes an upwardly extending limb on which is flexibly mounted, in cantilevered manner, a seat spaced from and at least partially overlying the top of the wheel. As the golfer sits down on the seat, the seat is deflected downwardly into engagement with the top of the wheel. The top of the wheel not only supports the seat but also acts as a fulcrum causing the cantilevered seat to lift the pendulum out of contact with the stub shaft, thereby assuring that all of the golfer's weight is imposed on the wheel and none on the stub shaft.

3,698,739

EXTENDABLE SELF-ALIGNING TRAILER HITCH

Leonard W. Szymanski, Niles, and Joseph A. Slaski, Elmwood Park, both of Ill., assignors to Lift Parts Mfg., Inc., Elk Grove Township, Ill.

Filed March 4, 1971, Ser. No. 120,874
Int. Cl. B60d *7/00*
U.S. Cl. 280—478 B 9 Claims



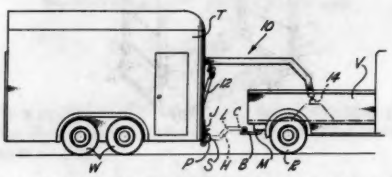
A trailer hitch for attachment to a powered vehicle to couple the vehicle to a trailer to be towed, the hitch being characterized in that it is both longitudinally shiftable and laterally swingable and includes automatic bearing means for centering and aligning the aligner bar of the hitch and automatic locking means for securing the aligner bar in its retracted position.

3,698,740

DETACHABLE GOOSE-NECK TOWING DEVICE

Eugene H. Chisholm, 10143 Avenda Maravilla, Cherry Valley, Calif., and Robert L. Stuart, 510 S. Monroe Street, Banning, Calif.

Filed Dec. 3, 1970, Ser. No. 94,675
Int. Cl. B60d *1/14*
U.S. Cl. 280—491 D 7 Claims



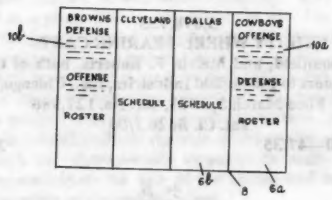
Provision is made for towing a trailer by a conventional hitch connectable to the rear bumper of a car, or by a goose-neck towing tongue having a front portion connectable to a towing vehicle between the front and rear wheels thereof. The rear portion of the tongue has depending terminal projections that are insertable in pockets in a structure on the trailer, while the tongue is disconnected and inclined rearwardly, and locked therein by swinging the tongue upwardly. Each pocket has a semi-cylindrical concavity and a sloping surface in facing relation thereto, and each projection has a mating convexity and a surface engaged by the sloping surface for locking the mating parts together. A rigid, stabilizing bar interconnects the tongue and trailer for transmitting a towing force and maintaining the tongue locked to the trailer.

3,698,741

GUIDE FOR WATCHING SPORTS

Harwood Bebbe, Jr., P.O. Box 2999, Spartanburg, S.C.

Filed Oct. 3, 1968, Ser. No. 764,877
Int. Cl. B42d *15/00*
U.S. Cl. 283—63 3 Claims

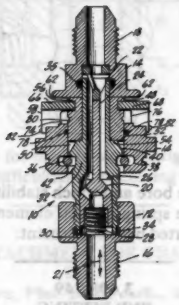


A guide for a sport such as football in which one team is on offense while the other is on defense has relatively stiff covers and leaves hinged in the covers and having creases on vertical lines. On the outer half of the front side of each sheet are printed the names of the offensive members of a particular team above the defensive members and on the back side the defensive members above the offensive members. By folding the pages inward, the members of the two teams will be shown with the defensive members of each team opposite the offensive members of the other team.

3,698,742
CONNECTOR WITH DISCONNECT WARNING INDICATOR

Harvey W. Jones, Long Beach, and Dudley A. Ryer, Jr., Westminster, both of Calif., assignors to McDonnell Douglas Corporation

Filed Nov. 23, 1970, Ser. No. 91,994
Int. Cl. F16l 29/00, 37/28
U.S. Cl. 285—39 8 Claims

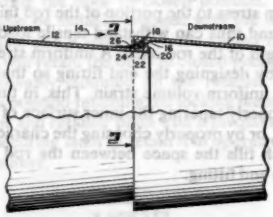


A connector assembly for allowing quick disconnecting of lines in fluid or pneumatic systems. The assembly requires the use of a special disconnect key to manually disconnect the connector portions thereof and the assembly includes means to retain the key in one portion of the connector assembly until the connector portions are reconnected, at which time the key may be removed therefrom. The key optionally includes a conspicuous warning flag so that upon inspection, it is obvious when the connector assembly is in a disconnected condition.

3,698,743
COMBUSTION LINER JOINT

Ervin J. Sweet, Trumbull; Brian W. Doyle, Shelton, and Joseph Rygelis, Monroe, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 28, 1971, Ser. No. 110,448
Int. Cl. F16l 53/00
U.S. Cl. 285—41 5 Claims

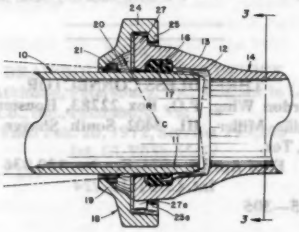


A combustion chamber liner is comprised of two telescoping sections, the leading edge of the downstream section overlapping the trailing edge of the upstream section. The end of the downstream section is provided with a plurality of peripherally spaced inwardly directed bosses. The inner peripheral surface of each of the bosses is grooved to accept a metal ring. The end of the upstream section is provided with a peripherally stepped surface having a supplemental groove, one end of which is open. The open end is closed by a spring snap ring which permits a sliding motion in only one direction. The two telescoping sections are joined by seating the ring in the groove in the downstream bosses and sliding the assembly over the snap ring, which prevents further movement between the sections. When cool, the dimensions of the upstream and downstream sections are such that there is a loose connection between the sections. However, the upstream section is subjected to more heat than the downstream section, causing it to expand to provide a tight fit.

3,698,744
AXIALLY LOCKED PIPE JOINT

William J. Bevington, West Lafayette, Ohio, assignor to Clow Corporation, Oak Brook, Ill.

Filed Jan. 6, 1971, Ser. No. 104,437
Int. Cl. F16l 17/02
U.S. Cl. 285—111 1 Claim

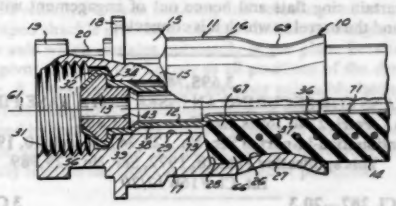


A joint for cast metal pipe in which relatively telescoping, gasket-sealed spigot and bell members are locked together against axial separation by a locking collar arrangement which permits limited, universal pivoting movement or angular deflection between the spigot and bell members without interference with the sealing function of the gasket.

3,698,745
HOSE COUPLING

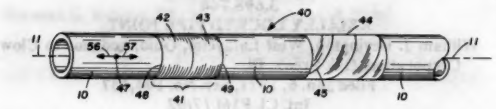
James E. Mundt, Mentor, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed May 3, 1971, Ser. No. 139,537
Int. Cl. F16l 33/20
U.S. Cl. 285—256 3 Claims



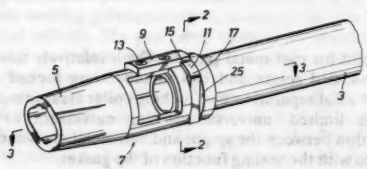
An inverted flare type hose coupling and its method of production, which includes a tubular eyelet providing at one end internal support for a hose end and at its other end a conical sealing seat for a flared tube. The seat portion of the eyelet is formed over and is supported by a conical ring assembled with the eyelet in a coupling body through an outer internally threaded end of the body.

3,698,746
CRACK ARRESTER
Rado G. Loncaric, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.
Filed Jan. 18, 1971, Ser. No. 107,296
Int. Cl. F16l 13/02
U.S. Cl. 285—286 7 Claims



A crack arrester and a pipeline containing at least one of the same wherein the crack arrester is a cylindrical part for use in-line in a pipeline, the cylindrical part having a longitudinal impact strength substantially greater than its transverse impact strength.

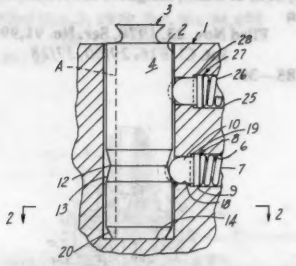
3,698,747
THREADLESS CONNECTOR
Wilson Gordon Wing, P.O. Box 22283, Houston, Tex., and John Bellis Miller, III, 3402 South Shaver, #7, South Houston, Tex.
Filed April 5, 1971, Ser. No. 130,936
Int. Cl. F16l 37/24
U.S. Cl. 285—305 6 Claims



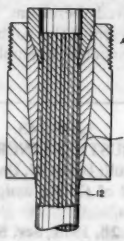
An improved connector for affixing in removable manner a choke or compensator-like device to the end of a gun barrel. The connector comprises a connector ring which is adapted to be fixedly attached to the end of the barrel and which receives thereover a connector clip which is in turn affixed to the choke or compensator device. The clip and connector ring coact with one another through a plurality of flat surfaces on the latter so that a simple rotative twist of the choke produces a snapping engagement of clip arms in certain of the ring flats. Removal of the choke is accomplished by rotation thereof so that the clip arms are caused to move out of engagement with the certain ring flats and hence out of engagement with the ring and the barrel to which it is connected.

3,698,748
MEANS FOR SECURING AN INSERT TO A BASE PIECE
Nello J. Petri, 2140 Jones, San Francisco, Calif.
Continuation-in-part of Ser. No. 122,947, March 10, 1971.
This application Feb. 28, 1972, Ser. No. 229,989
Int. Cl. F16b 12/20
U.S. Cl. 287—20.3 3 Claims

Means for removably securing an insert element to a larger base piece. The invention as disclosed solves the problem of securing an insert element, such as a punch, to a larger base piece such as a punch ring. In lieu of the usual set screw method of securing the punches to the punch ring, quick releasable means is provided for fixedly but removably securing the shank of a punch or the like within a bore in the punch ring. The cross sectional contour of the bore is formed so that the shank engages the bore at two points in cross section. The shank is forced against said two points by means of a pair of spring pressed elements, one of said elements also contributing to urging the shank against the bottom of the bore. The use of two spring pressed elements greatly contributes to the stability of shank in the bore and which stability could not be obtained by use of one spring pressed element regardless of the amount of force exerted by such element.



3,698,749
END FITTING
Edward H. Yonkers, Wilmette, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed Dec. 31, 1969, Ser. No. 889,418
Int. Cl. F16b 9/00
U.S. Cl. 287—20.3 11 Claims

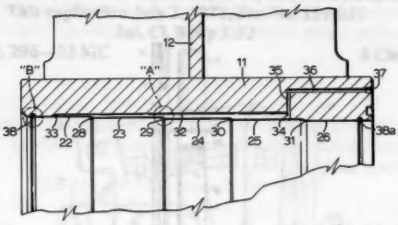


A tapered end fitting for a glass fiber rod applies a substantially uniform stress to the portion of the rod falling within the end fitting, and thus can withstand tensile loadings up to the tensile strength of the rod itself. A uniform stress distribution is achieved by designing the end fitting so that it subjects to the rod to a uniform volume strain. This, in turn, is achieved either by properly tapering the inner surface of the end fitting outer jacket, or by properly choosing the characteristics of the collect which fills the space between the rod and the outer jacket of the end fitting.

3,698,750
MEANS FOR ATTACHING A HUB TO A SHAFT
Peter de Hertel Eastcott, and James Ernest Welch, both of Peterborough, Ontario, Canada, assignors to Canadian General Electric Company Limited, Ontario, Canada
Filed Jan. 29, 1971, Ser. No. 110,980
Claims priority, application Canada, Oct. 7, 1970, 94981
Int. Cl. F16d 1/06
U.S. Cl. 287—52 R 9 Claims

A hub-shaft configuration wherein a hub having a stepped bore is an interference fit on a shaft having a stepped periphery, preferably five steps of approximately equal axial length. To assemble or disassemble the hub and shaft, a high pressure liquid is applied between the hub and the shaft to ex-

pand the hub. A multi stepped configuration reduces the distance that shaft must travel during assembly or disassembly



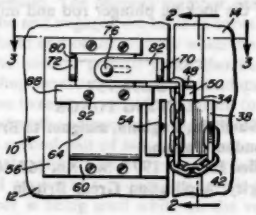
over that necessary for the two-step configuration of the prior art and avoids the difficulties in machining tapers.

3,698,751

SECURITY ATTACHMENT FOR CHAIN TYPE DOOR LOCK

Emanuel M. Moore, Pine Bluff, Ark., assignor to M & N Developers, Incorporated

Filed Dec. 3, 1970, Ser. No. 94,864
Int. Cl. E05c *17/30*
U.S. Cl. 292—264 **8 Claims**



A keeper is attached to a door jamb in alignment with a retainer plate mounted on the door and a locking member engaged with the keeper and overlying the retainer plate in one position for bridging the juncture between the door and door jamb for securing the door in closed position. The locking member can also be slidably engaged with the inner edge of the retainer plate and is tethered to the keeper by a chain so that the chain will retain the door in closed position. A securing latch is movably mounted on the retainer plate and is movable into a position retaining the locking member engaged with the keeper and retainer plate with a pivotal stop member engaging the securing latch to retain it in operative relation to the locking member.

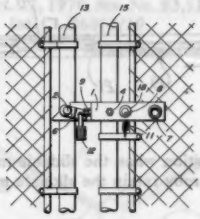
3,698,752

ROLL GATE LATCH

William F. Edwards, 3301 West Moreland Street, Phoenix, Ariz.

Filed Oct. 29, 1970, Ser. No. 85,191
Int. Cl. E05c *19/12*
U.S. Cl. 292—104 **4 Claims**

A latch for a roll gate, the device including a horizontal extending latch pin fitted through a fixed fence post, the fence post latch pin having a lock arm secured thereto and which is provided with an opening for receiving a pad lock and the invention including a latch unit supported on a gate vertical pipe, the unit including a pair of levers enjoined together, one of which is on each side of the roll gate vertical pipe and pivotable about the transverse rivet extending therethrough, one end of the levers each having a handle and the other end of the levers each being notched to fit around the fence post



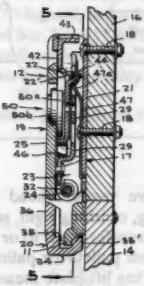
latch pin, one of the levers on its notched end having an opening therethrough for receiving the pad lock extending through the fence post latch pin lock arm.

3,698,753

DRAWBOLT LATCHING DEVICE

Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.

Filed Feb. 26, 1971, Ser. No. 119,205
Int. Cl. E05b *65/52*
U.S. Cl. 292—247 **16 Claims**



A drawbolt latching assembly for luggage cases and the like, including a keeper and a latching assembly to be mounted on the pair of luggage case sections. The latching assembly includes a mounting plate fixed to the luggage, a drawbolt body hinged along a first pivot axis to the mounting plate for swinging movement between latching and release positions, and a U-shaped shackle pivoted to the drawbolt body along a second pivot axis which remains outwardly of the plane between the first pivot axis and the keeper at all positions of the drawbolt body. A finger operated slide member releasibly latches the drawbolt body to the mounting plate. Resilient members are stressed by rotation of the shackle to angular positions relative to the drawbolt body during releasing movement to frictionally restrain the shackle at such angular positions.

3,698,754

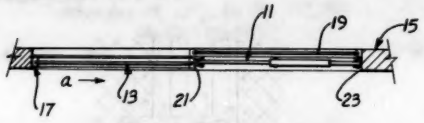
LOCK FOR SLIDING DOOR OR WINDOW

Lamoine E. Means, Newport Beach, Calif., assignor to PM Products, Inc., Newport Beach, Calif.

Filed Oct. 30, 1970, Ser. No. 85,456
Int. Cl. E05c *17/04*
U.S. Cl. 292—262 **8 Claims**

A lock for use with a sliding member such as a sliding door or window comprising first and second links pivotally interconnected adjacent their inner end portions. The outer ends

of the links are pivotally connected to fixed structure and the sliding member, respectively. The links are movable to an



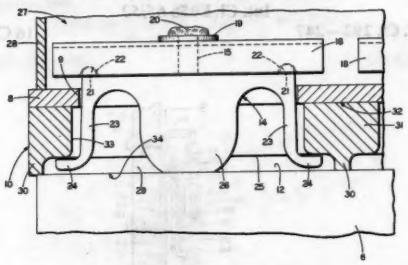
overcenter position when the slidable member is in a closed position to thereby retain the slidable member in the closed position.

3,698,755

VACUUM HEAD MAGNETIC VALVE CONSTRUCTION FOR PALLET LOADER

Gordon J. Sinclair, East Syracuse, N.Y., assignor to Diebold, Incorporated, Canton, Ohio

Filed April 29, 1971, Ser. No. 138,556
Int. Cl. B66c *1/02*
U.S. Cl. 294—65 **17 Claims**



A magnetic valve vacuum head construction for pallet loaders, for hoisting, or lifting rigid, sealed cartons, packages, boxes, or cases to transfer them to or from and to load or unload them to or from pallets for palletized material handling. The vacuum head has lift plate means with a work-engaging face communicating through a series of box-like cells and a mask plate to the plenum chamber of a blower mounted on the head supplying the suction. A series of orifices in the mask plate each form airflow passages between the cells and the plenum chamber. Each valve has a magnetic metal plate of larger dimensions than those of the controlled orifice and an actuator connected to the magnetic plate formed of nonmagnetic material. The actuator extends through the orifice and normally projects below the work-engaging face of the vacuum head to engage the cartons to be hoisted for opening the magnetic valve.

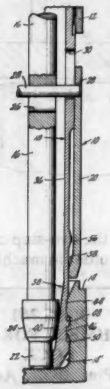
3,698,756

GRIPPER DEVICE HAVING POSITIVE ENGAGING AND DISENGAGING MEANS

Malcolm D. Groves, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 8, 1969, Ser. No. 882,832
Int. Cl. B66c *1/54, 1/42*
U.S. Cl. 294—96 **9 Claims**

A gripper device for selectively remotely coupling and uncoupling a linearly moving driving member to a member to be driven. The gripper device fixed to the driving member has a plurality of radially flexible fingers with each finger having a gripping surface at its outer end for gripping the member to be driven. Radial movement of the fingers into and out of gripping engagement is controlled by a central locking plunger rod and an outer unlocking sliding sleeve concentric with the flexible fingers. The locking plunger rod and the unlocking sliding sleeve are interconnected for limited relative movement and have cam surfaces oriented thereon, these cam surfaces selectively engaging cam surfaces on the flexible fingers to positively move the fingers into or out of gripping engagement with the driven member upon particular longitudinal movements of the locking plunger rod and unlocking sliding sleeve.

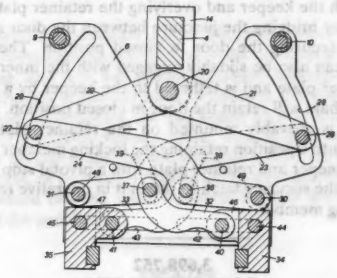


3,698,757

LIFTING TONGS

Henry Smith, Sheffield, England, assignor to British Steel Corporation, London, England

Filed July 16, 1971, Ser. No. 163,401
Claims priority, application Great Britain, Aug. 4, 1969, 37,524/69
Int. Cl. B66c *1/00*
U.S. Cl. 294—119 **10 Claims**



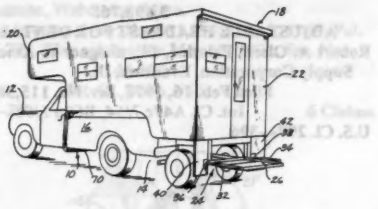
This invention relates to lifting tongs embodying pivotally linked cross arms secured in a frame and having jaws which are constrained by the frame to open and close along a common rectilinear path in response to an overhead lift. This invention avoids the drawback associated with conventional tongs in which the tongs move along an arcuate path wherein the thickness of, say, a slab which can be gripped satisfactorily with a particular jaw-opening range is limited. Further, the design in accord with this invention enables a firm grip to be obtained over the whole jaw-opening range.

3,698,758

JACK AND TIE-DOWN SYSTEM FOR A VEHICLE MOUNTED CAMPER

John N. Dodgen, Humboldt, Iowa

Division of Ser. No. 9,003, Feb. 5, 1970, Pat. No. 3,635,366.
This application July 2, 1971, Ser. No. 159,237
Int. Cl. B60p 3/32
U.S. Cl. 296—23 MC 6 Claims



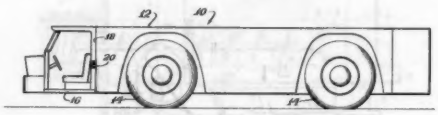
A jack and tie-down system for a vehicle mounted camper including a first pair of jacks secured to the lower front corners of the camper and a second pair of jacks secured to the rearward end of the camper. The front jacks each include a vertically movable leg portion extending downwardly therefrom. A U-shaped support member is secured to the lower ends of the two leg portions and extend therebetween. The support member serves as a stand for the front end of the camper when the camper is removed from the vehicle and also provides a means for leveling the camper when it is being used while on the vehicle. The support member extends beneath the vehicle frame and engages the same to serve as a tie-down means for the front end of the camper when the camper is on the vehicle. The second pair of jacks also have a support member extending therebetween which is adapted to engage the vehicle frame to serve as a tie-down means for the rear end of the camper when the camper is on the vehicle. The support member on the second pair of jacks also serves as a stand for the back end of the camper when the camper is removed from the vehicle and serves as a means for leveling the camper when the camper is being used while on the vehicle. In the modified form of the system, the second pair of jacks are pivotally connected to the auxiliary axle and wheel assembly which supports the rearward end of the camper. In the modified form of the embodiment, a support member does not extend between the jacks of the second pair of jacks.

3,698,759

SUPPORTING, LEVELING AND HEIGHT ADJUSTMENT MEANS

Robert G. Luft, Wildwood, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 7, 1970, Ser. No. 52,939
Int. Cl. B62d 27/00
U.S. Cl. 296—35 R 3 Claims



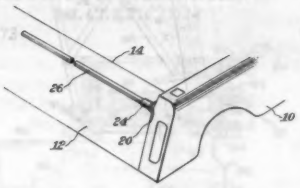
A means for supporting, leveling and adjusting the height of a sub-frame relative to a main frame including a pair of laterally spaced, vertically adjustable elements carried by the main frame and a surface formed on the sub-frame capable of engaging said elements. Selective adjustment of the vertically adjustable elements permits proper alignment of the sub-frame relative to the main frame and fastening means lock the two frames relative to each other.

3,698,760

TAIL GATE PROTECTOR AND LOAD BAR

L. B. Lane, McGregor, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 83,115
Int. Cl. B60j 5/10
U.S. Cl. 296—50 4 Claims



A horizontal elongated bar is secured by outwardly extending brackets to the top outside surface of the tail gate of a pick up truck.

3,698,761

SCREEN FOR A WINDOW-PANE OF THE REAR WINDOW OF A MOTOR-CAR

Takashi Niwa, No. 2-9-9, Shingashi, Itabashi-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 834,604, Jan. 10, 1969, abandoned, which is a continuation of Ser. No. 407,755, Oct. 30, 1964, abandoned. This application July 15, 1970, Ser. No. 55,275
Claims priority, application Japan, Nov. 5, 1963, 38/83165
U.S. Cl. 296—97 F 2 Claims

This invention discloses a screen for a window-pane of the rear window of a motor vehicle or the like which is formed of a transparent colored sheet of synthetic resin to prevent the passage of direct sunlight and thermic rays, the formation of mist on the window-pane and the dazzle by head lights of succeeding cars at night. The screen being made of a single sheet of rather flexible and rigid synthetic resin and having the same shape and at least the same size as the extended surface of the curved window-pane, it is fitted to said window-pane in surface to surface contact adapting the entire contour thereof in strut bridging.

3,698,762

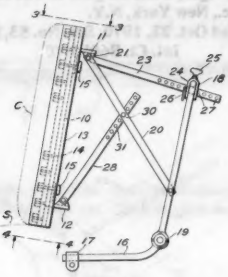
MOTOR CYCLE BACK RESTS

Wayne D. Gorman, 855 N. Dakota Street, Chandler, Ariz.

Filed Jan. 18, 1971, Ser. No. 107,135
Int. Cl. B62j 1/00
U.S. Cl. 297—195 6 Claims

A motor cycle back rest which can be mounted by means of an articulate framework. The back rest proper can be adjusted

up or down. Further adjustment of the backrest, consisting of angle of tilt, and movement toward and away from the front of



the motor cycle, is provided by the design of the framework by which it is supported.

3,698,763

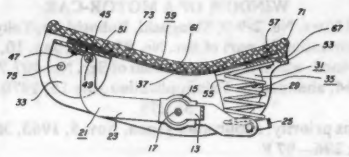
BICYCLE SADDLE

George W. Worley, Bolivar, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.

Filed Oct. 26, 1970, Ser. No. 83,903

Int. Cl. B62j 1/18

U.S. Cl. 297—214 **6 Claims**



A saddle intended to be mounted on a single saddle post of a bicycle. The saddle includes a horizontally extending lower truss having usual structure for attaching the truss to the post of the bicycle, and an upper frame assembly supporting a resilient cover. The frame assembly is pivotally attached forwardly and resiliently attached rearwardly thereof to the lower truss and includes interposed leaf springs which act in conjunction with the resiliency of the cover to cushion the rider, i.e., the leaf springs contiguously engage the underneath surface of the cover, and the weight of the rider flexes both the leaf springs and the cover intermediate the length thereof.

3,698,764

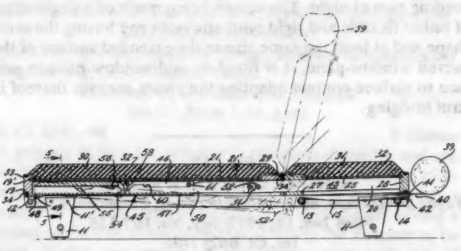
CHAISE LOUNGE

Arthur J. Geddings, 205 West Broadway, Myrtle Beach, S.C.

Filed Feb. 17, 1971, Ser. No. 116,184

Int. Cl. A47c 17/16

U.S. Cl. 297—356 **5 Claims**



A chaise lounge having a base frame and a body mounted thereon with an extension of said body forming a backrest adjustable from a horizontal to an inclined position, and a flexible generally horizontal mounted support carried between spaced cross members beneath said backrest with an adjustable bracket for maintaining said backrest in an elevated position, and a removable covering for said body, said body being provided with dovetailed grooving along the same and said covering being retained therein by a resilient compressed insert.

3,698,765

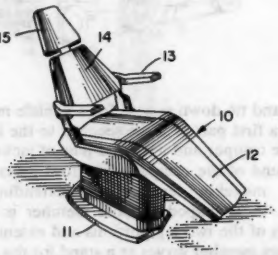
ADJUSTABLE HEADREST FOR DENTAL CHAIRS

Robert A. Olsen, Palatine, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 16, 1971, Ser. No. 115,385

Int. Cl. A47c 7/54; B60n 1/06

U.S. Cl. 297—396 **16 Claims**



An adjustable headrest particularly suitable for use in combination with dental chairs. The headrest is provided with a depending bar which is slidably received in a passage or channel within the backrest. Spring means and friction locking means within the backrest cooperate with the bar to secure it in any selected position of adjustment.

3,698,766

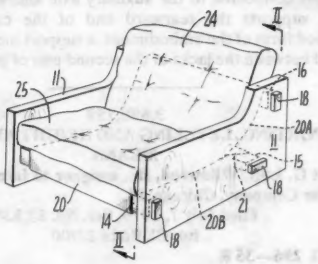
SLING TYPE UPHOLSTERED FURNITURE

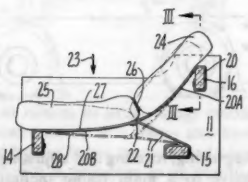
Martin Borenstein, 2679 Mountaingate Way, Oakland, Calif.

Filed Nov. 10, 1969, Ser. No. 875,077

Int. Cl. A47c 7/00, 7/20, 5/00

U.S. Cl. 297—441 **8 Claims**





Furniture construction where the back and seat portions are a unitary fabric or other suitable flexible material loosely hung or slung between a top back rail and a front rail with no other support. However, the loose hanging of the back and seat is restrained by a piece of fabric or the like, secured at one side to a lower back rail and at its opposite side to the slung fabric

adjacent a point which would otherwise be the juncture of the back with the seat, straightening the back portion of the fabric under vertical pressure on the seat portion while retaining the slung comfort of the seat portion. The slung portions are covered by unified upholstered seat and back elements which altogether simulate a piece of upholstered furniture.

3,698,767

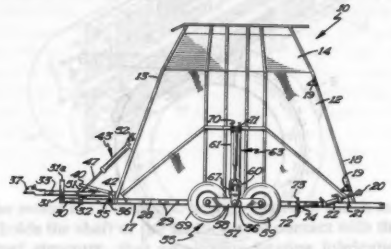
HAYSTACK FORMING DEVICE

Howard G. Hanson, Wolverton, Minn.

Continuation-in-part of Ser. No. 881,697, Dec. 3, 1969, Pat. No. 3,596,784. This application May 19, 1971, Ser. No. 144,890

Int. Cl. B60p *1/56*

U.S. Cl. 298—27 **6 Claims**



A mobile haystack forming device includes a housing supported by ground engaging wheels which are vertically shiftable between a lowered extended travel position and a raised retracted position wherein the housing is positioned from the surface of the ground. The housing has a floor structure which is forwardly movable to open the lower end of the housing and allow the haystack to be positioned upon the ground. The housing also has rear doors which are power shifted to an open position to permit the housing to be pulled forwardly away from the haystack. A hitch mechanism connects the device to the towing vehicle and is releasably locked to the floor structure when the haystack forming device is being towed, but is longitudinally shiftable relative to the floor structure in a forward direction to produce a jarring effect on the housing prior to moving the floor structure to an open condition. This facilitates release and removal of the haystack from the housing.

3,698,768

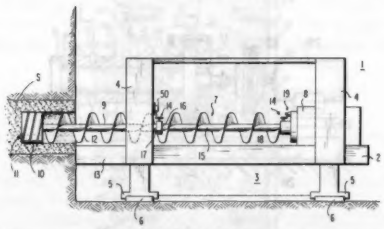
AUGER MINING MACHINE

John L. Delli-Gatti, Fairmont, W. Va., assignor to Fair-Quip Corporation, Fairmont, W. Va.

Filed June 18, 1971, Ser. No. 154,588

Int. Cl. E21c *27/20*

U.S. Cl. 299—55 **29 Claims**



An improved auger mining machine is disclosed. The machine includes an auger string composed of a plurality of auger sections connected to each other and, at the rearward of the string, to a rotary drive means. Each connection is by means of a pin and socket joint which includes a locking means biasly mounted on the socket having associated therewith an unlocking member. A plurality of unlocking means are mounted on the machine to permit separation of one auger section from another and from the rotary drive means. The front unlocking means is pivotably mounted.

3,698,769

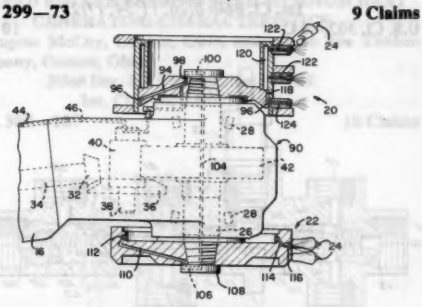
MINING MACHINE HAVING LIQUID SUPPLY SEALING MEANS

Michael J. Amoroso, Pittsburgh, Pa., assignor to Lee-Norse Company, Charleroi, Pa.

Filed Dec. 30, 1970, Ser. No. 102,769

Int. Cl. E21c *27/24*

U.S. Cl. 299—73 **9 Claims**



Mining machine having a rotary mining head including a rotatable support carrying cutter supporting drum means, wherein liquid such as water is discharged through discharge outlets peripherally of the drum means. The liquid is supplied through passage means in nonrotatable supporting means and communicating passage means in the rotary mining head, leakage at the connection of such passage means being prevented by a plurality of sealing rings which encircle the support laterally spaced apart longitudinally of the latter adjacent opposite sides of such connection. Leakage past the sealing rings flows externally of the mining head, whereby such leakage is readily and quickly detectable; and means separate from the sealing rings prevent liquid leakage past the latter from flowing to the bearings mounting the support and/or to the gears through which the mining head is rotatably driven.

3,698,770

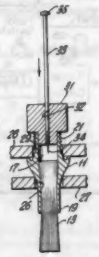
BRUSH MAKING APPARATUS

William James Landen, Cheshire, and Gunnar F. Lundquist, Kensington, both of Conn., assignors to The International Silver Company, Meriden, Conn.

Division of Ser. No. 884,723, Dec. 12, 1969, which is a division of Ser. No. 692,416, Dec. 21, 1967, Pat. No. 3,499,686. This application Jan. 3, 1972, Ser. No. 214,777

Int. Cl. A46d *3/04*

U.S. Cl. 300—1 **8 Claims**



The invention contemplates a brush in which a bundle of natural brush bristles is secured to a tubular retaining ferrule having a bore open at both ends. The root ends of the bristles are assembled within the bore, with the tip ends projecting outwardly as the applicator end of the brush. A guided pin is inserted on the central axis of the bundle to radially outwardly

further compact the bristles in the bore, and to serve a molding function as a thermosetting resin is cured to hardness; the root ends are thereby bonded to each other and to the ferrule, and a smooth central passage is defined for pomade supply.

3,698,771

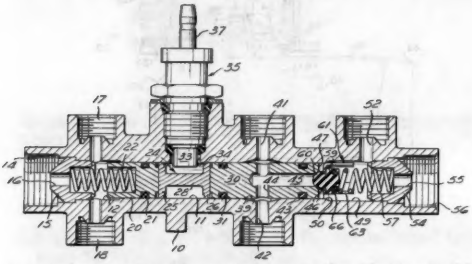
BRAKE WARNING SWITCH WITH BYPASS

Frederick D. Keady, Cleveland Heights, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Aug. 7, 1969, Ser. No. 848,321

Int. Cl. B60t 8/26, 11/34, 17/22

U.S. Cl. 303—6 C **10 Claims**



A dual pressure switch unit utilized in dual brake systems for motor vehicles includes a valving mechanism operable by a pressure differential to change the circuitry of one of the two dual systems. In a system utilizing a pressure reducing valve in the rear brakes, failure of the front brakes will operate the valve and switch unit to close the switch to actuate a signal and to bypass the pressure reducing valve to supply full pressure to the rear brakes. This valving action is produced by an opening in a central valve spool normally closed by a member which is restrained in the housing and moves away from a closed position against the opening when the valve member is moved axially by a pressure differential. Whenever the valve member is returned to a neutral position, the opening is closed to return the pressure reducing valve to the circuit.

3,698,772

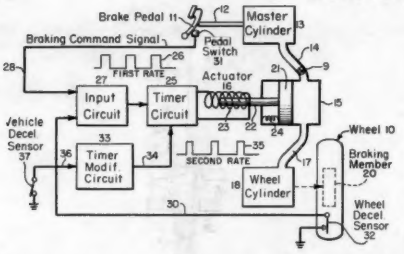
BRAKE CONTROL SYSTEM FOR PULSING VEHICLE BRAKES AT VARIABLE PULSE RATES

James E. Nixon, Warren, Mich., assignor to Borg-Warner Corp., Chicago, Ill.

Filed March 18, 1970, Ser. No. 20,678

Int. Cl. B60t 8/12

U.S. Cl. 303—21 BE **20 Claims**



A brake control system includes an actuator which relieves and restores the braking force to a vehicle wheel in a cyclical manner under control of a timer. The timer normally operates at a first rate when it receives both a braking command signal and a wheel deceleration signal. If the vehicle deceleration exceeds a certain level, the rate of timer operation, and therefore the rate of actuator operation, is changed to a second rate to accommodate the wheel-to-road adhesion range indicated by the vehicle deceleration signal.

3,698,773

BEARINGS FOR PRECISION APPARATUS

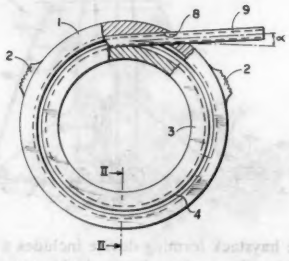
Lennart Gunnar Oskar Dahlgren, Vastra Frolunda, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed Dec. 10, 1969, Ser. No. 883,746

Claims priority, application Sweden, April 29, 1969, 6139/69

Int. Cl. F16c 17/00, 27/06

U.S. Cl. 308—8 **3 Claims**



A bearing of the type which comprises an outer ring and an inner ring mounted for rotation one within the other, wherein the confronting edge portions of the rings are provided with grooves to form a channel therebetween, into which is inserted a hose of resilient material having a low coefficient of friction, the diameter of the hose being such that the hose is slightly deformed when entering the channel, to form bearing surfaces against the sides of the grooves.

3,698,774

SPINDLE ASSEMBLY AIR BEARINGS

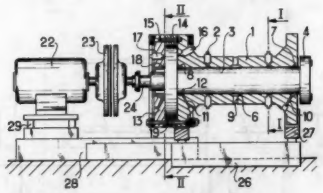
Claude Saulgeot, Annecy, and Jean-Noel Coste, Poisy, both of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed May 19, 1971, Ser. No. 144,939

Claims priority, application France, May 20, 1970, 7018207

Int. Cl. F16c 19/16

U.S. Cl. 308—9 **9 Claims**



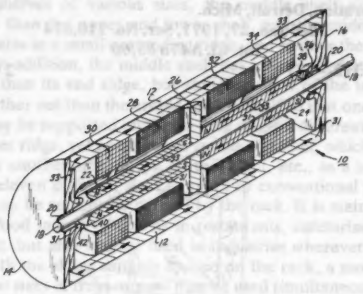
A spindle assembly includes a sleeve bearing having a number of air nozzles equi-angularly arranged about a shaft. A thrust bearing supports one end of the shaft with clearances for air support. The air nozzles generally have a frusto-conical air passage with a central bore.

3,698,775

MAGNETIC SUPPORT AND MOTOR STRUCTURE

Roswell W. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.

Filed April 1, 1970, Ser. No. 24,665
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 16 Claims



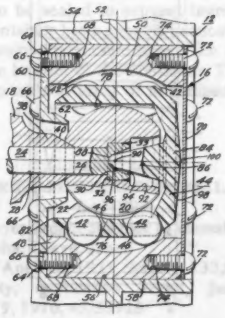
The motor has a magnetic bearing structure which suspends and holds the shaft of the motor out of contact with the shaft support structure, thus eliminating bearing lubrication and wear problems and making it possible to operate the device in a vacuum. The shaft is permanently magnetized, and a positive feedback amplifier is used together with multiple coils to control an axial magnetic field and thus maintain the shaft in a position of equilibrium between the ends of the bearing structure, and to magnetically hold the shaft against transverse movement. Rotary drive force is applied to the rotor either by conventional means such as a wound rotor driven by a stator which develops a rotating magnetic field, or by simply causing the axial magnetic field to change with changes in the relative rotational positions of the shaft and the ends of the bearing structure.

3,698,776

CENTER THRUST RETAINER FOR SPHERICAL RACE BALL BEARINGS

Bernard Litman, Wantagh, and Everett R. Silvia, both of Huntington Station, N.Y., assignors to Ambac Industries, Inc., Garden City, N.J.

Filed Nov. 15, 1971, Ser. No. 198,570
Int. Cl. F16c *31/06*; G01c *19/16*
U.S. Cl. 308—35 8 Claims



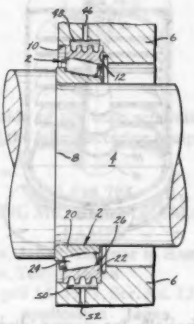
A spherical bearing assembly for gyroscopes and the like including means for minimizing the frictional effects of acceleration loads on the ball retainer. Said means includes a structural support arrangement for the retainer whereby the retainer is supported during acceleration at the center of the bearing. A cavity within the inner race extending to a point comprising the center of the bearing is adapted to receive an axial stem portion of the retainer. A tip portion of the retainer stem is adapted to seat against a spherical surface within the inner race located substantially at the bearing center. This arrangement reduces gyro precession by minimizing the frictional moments about the roll, yaw and pitch axes.

3,698,777

TAPERED ROLLER BEARING WITH MINIMUM HEAT GENERATING CHARACTERISTICS

Wyn Eugene McCoy, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Dec. 8, 1970, Ser. No. 96,189
Int. Cl. F16c *33/66*, *33/00*
U.S. Cl. 308—187 10 Claims



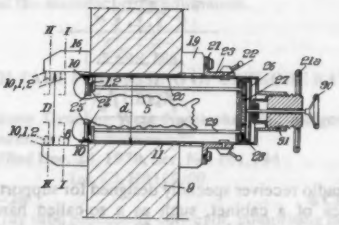
A tapered roller bearing has shallow circumferentially extending grooves in the tapered raceways of its cup and cone. Those grooves prevent full line contact between the frustoconical side surfaces of the tapered rollers and the tapered raceways and this in turn reduces the elastohydrodynamic oil film. The reduction of the elastohydrodynamic oil film minimizes the generation of heat within the bearing. The cup is further provided with annular channels through which oil is circulated to dissipate heat from the bearing.

3,698,778

GLOVE MOUNTING RING DEVICE TO PERMIT OF PERFORMING OPERATIONS IN A SEALED CONTAINER

Eric Jean Townsend, Vitry, Seine, and Marcel Fortin, Maurepas, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

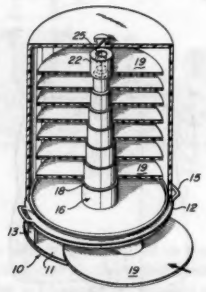
Division of Ser. No. 655,058, July 21, 1967, Pat. No. 3,541,648. This application July 7, 1969, Ser. No. 869,982
Claims priority, application France, Aug. 1, 1966, 6671635; Aug. 1, 1966, 6671636
Int. Cl. A61g *11/00*
U.S. Cl. 312—1 7 Claims



For the fixation of a flexible glove intended to permit of performing operations in a sealed container, use is made of a ring

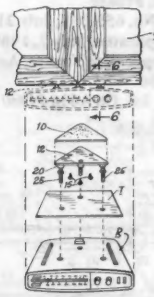
made of ring elements hinged to one another and some of which are always located on the outline of the ring, whereas the others can be retracted inside this outline. Expansion of the ring is obtained by pushing in the outward direction the hinges between two ring elements of the second kind. Such a ring is adapted to fit in the expansible gutter-shaped edge of the deformable glove.

3,698,779
CONTAINER
Raymond W. Holmes, and Elizabeth E. Holmes, both of 481 Nunn Avenue, Wilmington, Ohio
Filed Dec. 8, 1970, Ser. No. 96,023
Int. Cl. A47f 3/14, 3/06; A47b 88/00
U.S. Cl. 312—126 **9 Claims**



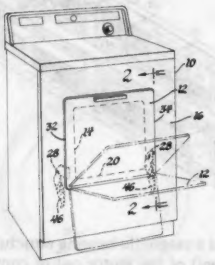
A container especially for storing, displaying and, under some conditions, shipping food and other perishable products. Preferred embodiments feature a stepped post member each step of which mounts a separable rack or tray which may have dual function. This post member is separably related to a base mounting a cap-like enclosure for the post-tray assembly. In certain embodiments the base is designed to provide a storage receptacle for the separable trays.

3,698,780
UNDER-CABINET RADIO
Edward C. Collins, Deerfield, Ill., and Eugene C. Hittle, Columbus, Ind., assignors to Sears, Roebuck and Co., Chicago, Ill.
Filed Nov. 10, 1969, Ser. No. 875,250
Int. Cl. A47b 67/02; F16f 15/00; A47f 5/00
U.S. Cl. 312—245 **6 Claims**



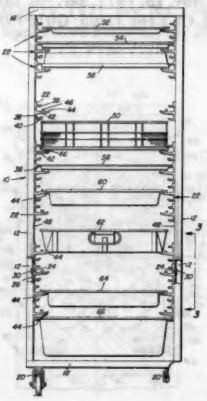
A radio receiver specially designed for support on the lower surface of a cabinet, such as a so-called hanging kitchen cabinet, in combination with mounting means therefor. Downwardly projecting pins are detachably secured to the bottom wall of the cabinet while the radio housing is provided with female means adapted to receive said pins together with manually operable means for detachably engaging said pins. Provision is made for selectively locating the radio at a predetermined elevation relative to the bottom wall of the cabinet.

3,698,781
CABINET DOOR MOUNTING
Joseph B. Dunn, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 27, 1971, Ser. No. 110,014
Int. Cl. A47b 88/00
U.S. Cl. 312—327 **2 Claims**



A door pivotally mounted about a horizontal axis on the front surface relative to a cabinet access opening. Sector brackets having a cam surface and retaining recesses are attached to each side of the door for movement into and out of the cabinet. Spring biased detent members are positioned on the inner side of the cabinet front surface continuously engaging the sector brackets releasably retaining the door in open positions of varying degrees so the door can be utilized as a chute, a shelf, or be moved to a non-obstructing open position. Engagement of the detent members with the cam surfaces continually urges the door closed.

3,698,782
MULTI-SHELVED SLIDE RACK
Bruno Onori, 4240 N. W. 135th Street, Miami, Fla.
Filed April 9, 1971, Ser. No. 132,654
Int. Cl. A47b 88/00
U.S. Cl. 312—350 **5 Claims**



This device is a rack and a number of multi-shelved slides detachably secured thereon for supporting as many as eleven different size pans and/or trays. The rack, made generally of high tensile aluminum alloy, is rectangular in shape, and has four vertical uprights, one at each corner supporting a roof

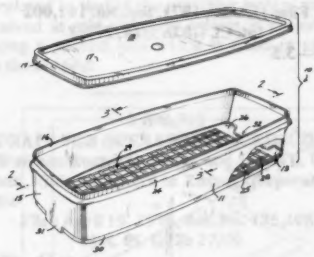
and mounted on a base, preferably with four swivelled caster wheels on the bottom of the base for portability. It is open at least at the front, and the confronting sides of each pair of side uprights are provided with a number of suitable vertically spaced female keyhole slots in which the pan or tray supporting slides, made generally of extruded aluminum, are secured or mounted by means of male headed studs extending the backs of the slide. These studs extend from the back wall of the slides, and on the front wall of the slides, there are at least three shelves of various sizes, the middle shelf extending further than the upper and lower shelf, and the middle shelf terminates in a small upstanding ridge, and so does the bottom shelf. In addition, the middle shelf has an intermediate ridge, higher than its end ridge, but stopping short of the top shelf and further out than the end of the top shelf so that one size of tray may be supported on this middle ridge, a different size on the outer ridge, yet another size on the top shelf, which is flat, yet still another size on the bottom shelf, etc., as a result of which eleven different sizes or types of conventional pans or trays may be selectively carried by the rack. It is mainly used in the food industry, such as in restaurants, cafeterias, bakeries, etc. but also may be used in industries wherever desirable. With the slides suitably spaced on the rack, a number of different sizes of trays or pans may be used simultaneously.

3,698,783

STORAGE CONTAINER FOR CELERY OR THE LIKE

James B. Swett, Barrington, R.I., and Sidney Z. Smith, Worcester, Mass., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Jan. 28, 1970, Ser. No. 6,462
Int. Cl. B65d *25/00*
U.S. Cl. 312—351 **1 Claim**



A storage container for celery or the like comprising a container adapted to be sealed to prevent ingress or egress of moisture. The container has a support particularly adapted to position the contained vegetable above the moisture which will collect in the bottom of the container. The support also positions the vegetable at areas of minimized points of contact.

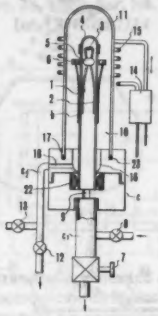
3,698,784

MANUFACTURING METHOD FOR SMALL ELECTRIC LAMPS

Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Denkyu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed April 14, 1971, Ser. No. 133,875
Claims priority, application Japan, June 19, 1970, 45/53914; June 19, 1970, 45/53915
Int. Cl. H01j *9/18*
U.S. Cl. 316—19 **4 Claims**

The present disclosure provides a new simplified method for manufacturing small electric lamps to be used within electronic equipment, particularly small electric lamps of long life and high quality, by heating from the outside of the bulb and fusing together the bulb and the bead of the bead mount attached with a filament, using equipment which can evacuate



the inside and outside of the bulb separately; electric lamps thus produced; and the manufacturing equipment.

3,698,785

MANUFACTURING METHOD FOR SMALL ELECTRIC LAMPS

Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Denkyo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed April 14, 1971, Ser. No. 133,874
Claims priority, application Japan, June 19, 1970, 45/53916; June 19, 1970, 45/53917
Int. Cl. H01j *9/18*
U.S. Cl. 316—19 **5 Claims**

The present disclosure provides a new method for manufacturing small electric lamps to be used within electronic machines, etc., particularly small electric lamps with long life and high quality, using a simplified process and equipment, e.g., by vacuum-sealing the entire filament-attached bead mount in a bulb, and then, with the bead mount set in position, heating from outside of the bulb to fuse together the bead of the bead mount and the bulb; small electric lamps thus produced; and the manufacturing equipment.

3,698,786

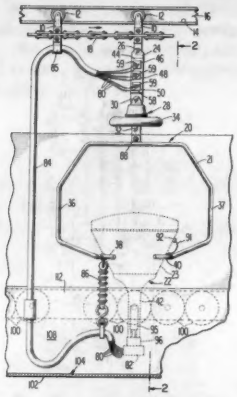
HIGH VOLTAGE PROCESSING OF CATHODE RAY TUBES

Edward Anthony Gronka, West Nanticoke, Pa., assignor to RCA Corporation

Filed Dec. 28, 1970, Ser. No. 101,794
Int. Cl. H01j *9/00*
U.S. Cl. 316—26 **6 Claims**

A cathode ray tube processing conveyor, comprising means for energizing the cathodes and applying a high voltage to the high voltage accelerating electrodes of the tubes, is provided with two rows of magnetic field coils of alternating polarities

mounted on opposite sides of the conveyor and adjacent to the path of the tubes therealong, for deflecting the beams and



thereby preventing damage to the screen during the application of the high voltage.

3,698,787

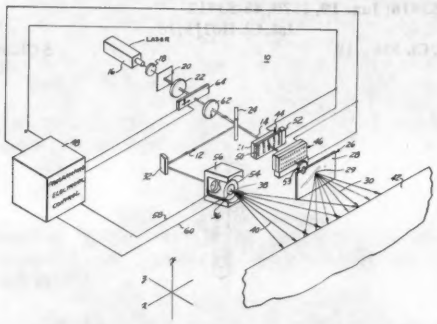
HOLOGRAM SYNTHESIS USING A DISPLACEABLE REFERENCE POINT SOURCE

Rolf K. Mueller, Brighton, Mich., and Emanuel Marom, Tel Aviv, Israel, assignors to The Bendix Corporation

Filed Feb. 19, 1971, Ser. No. 116,983

Int. Cl. G02b 27/22

U.S. Cl. 350—3.5 **25 Claims**



A photographic record of a hologram that will produce a three-dimensional image when illuminated with a beam of coherent laser radiation is produced synthetically by directing coherent laser light from two point sources to interfere proximate a recording film. The interference pattern produced depends on the relative positions of the two point sources. Both sources are moved according to a predetermined program to a number of different positions, with one source constrained to move in a single plane and the other along a line normal to this plane. The various interference patterns are superimposed on the recording film to form a complex hologram. The method and apparatus of this invention can be used to create images of real as well as fanciful scenes.

3,698,788

MULTIPASS INTERFEROMETER

Richard O'Regan, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

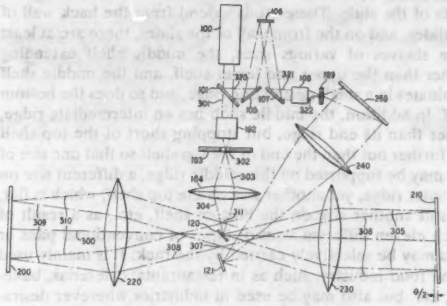
Filed June 29, 1971, Ser. No. 157,927

Int. Cl. G01b 9/02; G02b 27/22

U.S. Cl. 350—3.5 **12 Claims**

An interferometer is provided with a multipass optical cavity. In the multipass optical cavity, an object beam passes several times through the object space. The sensitivity of the interferometer is increased by a factor directly proportional to the number of passes through the object space.

The multipass cavity comprises two cavity mirrors and an arrangement of lenses. The lenses image each cavity mirror



onto the other. A light ray incident on a particular point on one of the cavity mirrors returns to the same point on each subsequent pass through the cavity. The object beam is extracted from the cavity after it has made the desired number of passes. It is then combined with a reference beam to form an interference pattern or a hologram.

3,698,789

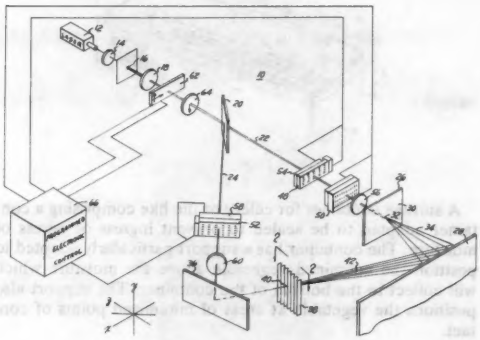
APPARATUS EMPLOYING A GRATING TO PROVIDE AND MOVE THE SOURCE OF A WAVE ENERGY DISTRIBUTION

William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation

Filed Oct. 20, 1971, Ser. No. 191,002

Int. Cl. G02b 5/18, 27/38

U.S. Cl. 350—3.5 **2 Claims**



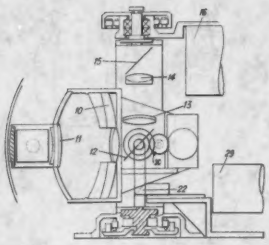
A hologram is synthesized by moving two apparent sources of diverging wave energy distributions to form different interference patterns and by superimposing these interference patterns on a recording surface. The source or apex of one diverging wave energy distribution is moved substantially in a plane. The source or apex of the other diverging distribution is moved substantially perpendicular to the recording surface by directing a thin beam of laser light to strike a blazed grating disposed substantially perpendicular to the recording surface. The grating expands the received laser beam to form a diverging wave energy distribution. The apex of this distribution is moved by deflecting the laser beam to strike different positions on the grating at different distances from the recording surface.

3,698,790

STABILIZED OPTICAL SYSTEMS

Peter John Berry, Glasgow, Scotland, assignor to Barr and Stroud Limited, Glasgow, Scotland

Filed Aug. 31, 1971, Ser. No. 176,535
Claims priority, application Great Britain, Nov. 18, 1970, 54,781/70
Int. Cl. G02b 23/02
U.S. Cl. 350—16 8 Claims



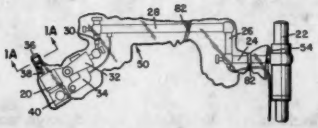
A stabilized optical system comprising a servo-stabilized platform mounted on a support for rotation about a first axis, an objective system secured to said platform, and a mirror mounted on said platform for rotation about said first axis, the reflecting surface of said mirror containing said first axis, the objective system being so located that the focal point thereof lies on said reflecting surface, and the first axis passing through said focal point, and a driving connection between the mirror and the platform whereby the angular movement of the mirror is related to that of the objective system so that a light beam received at said objective system is projected by said mirror along a second axis which is fixed in position with respect to the support.

3,698,791

DRAPE FOR OPERATING MICROSCOPE

David L. Walchle; Russell G. Smith, and James L. Geraci, all of Cincinnati, Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed April 19, 1971, Ser. No. 135,108
Int. Cl. G02b 27/00
U.S. Cl. 350—61 21 Claims



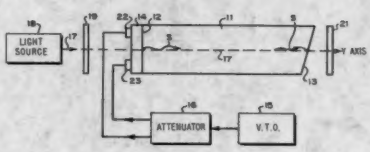
The microscope drape is fabricated from a very thin, transparent, heat-resistant plastic film which is adapted to completely house an operating microscope including its support arms whereby no air can escape from the interior of the drape except through the open end thereof which is located remote from the microscope. The drape includes an optically clear, distortion free, transparent lens and means for disposing said lens in parallel, enclosing relationship with the objective lens of the microscope. The drape also includes cylinder-defining ocular-housing extensions which include means for securing said extensions to the oculars of a microscope for precluding the escape of air from the interior of the drape by way of said extensions.

3,698,792

OPTICALLY TRANSPARENT ACOUSTIC WAVE TRANSDUCER

John A. Kusters, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 28, 1970, Ser. No. 101,632
Int. Cl. G02f 1/24
U.S. Cl. 350—149 7 Claims



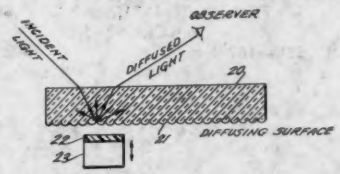
An acoustic wave transducer mounted on the input face of a body of optically anisotropic birefringent material is provided with an electrode structure for permitting substantially unobstructed passage of a light beam through the transducer and into the body of optically anisotropic birefringent material and for producing a tangential electric field in the transducer to generate an acoustic wave that propagates collinearly with the light beam into the body of optically anisotropic birefringent material.

3,698,793

SOLID STATE DISPLAY

Jacob Tellerman, Bayside, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

Continuation-in-part of Ser. No. 700,127, Jan. 24, 1968, abandoned. This application March 11, 1971, Ser. No. 123,132
Int. Cl. G02f 1/36; G09f 13/00; G02f 1/34
U.S. Cl. 350—160 R 21 Claims



A movable element is selectively operated to press an opaque member into engagement with a selected region of a light diffusing boundary to convert such region between a light absorbing condition and a light reflecting condition. An array of movable elements can be selectively actuated to define a variety of patterns that can be presented on the illuminated side of the boundary. The movable elements may be piezoelectric or magneto-strictive elements. In one embodiment, the movable elements carry a soft black rubber surface for contact with an optical boundary defined by the rear face of a transparent glass panel. In another embodiment, the movable elements carry smooth black surfaces for contact with rubber films on the rear face of a transparent glass panel to define an optical boundary.

3,698,794

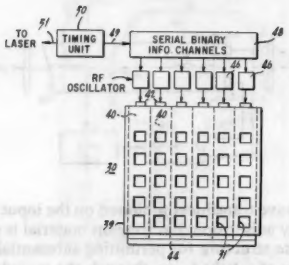
SONIC PAGE COMPOSER FOR HOLOGRAPHIC MEMORY

Gerard Argant Alphonse, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 2, 1970, Ser. No. 94,245
Int. Cl. G02f 1/32
U.S. Cl. 350—161 4 Claims

A page composer is disclosed for translating a plurality of serial electrical binary information signals to a pattern of light

on an opto-magnetic recording medium. A plurality of radio-frequency oscillators each has a control input coupled to a source of serial binary information signals, and an output coupled to an electro-mechanical transducer at one end of a respective one of a plurality of acousto-optic columns. Sonic information is thus propagated serially through the columns as information cells which contain a sonic burst to represent one



binary value, and no burst to represent the other binary value. Incident light from a source is directed through the columns at an angle with the sonic wavefronts therein to cause diffraction of the light. The source of light is pulsed when the columns are filled with serially-supplied sonic information. Cells containing a sonic burst cause a diffraction of the light passing therethrough, and cells not containing a sonic burst permit the light to pass directly therethrough.

3,698,795

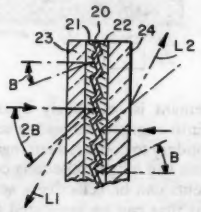
DIFFRACTION GRATING WITH TWO DIFFRACTING SURFACES

Bruce K. Flint, Lancaster, Mass., assignor to Acton Research Corporation, Acton, Mass.

Filed Jan. 26, 1971, Ser. No. 109,861

Int. Cl. G02b 5/18

U.S. Cl. 350—162 R **25 Claims**



A spectral dispersion reflective grating comprises a vacuum deposited metal film with straight, parallel grooves. The film is of a thickness such that it is opaque and both its surfaces are substantially identical. The film is supported on a glassy blank or frame which permits light to be transmitted to, and reflectively diffracted from, either or both of the film surfaces. Elements on the support detachably engage a grating in the mount for use of either grooved film surface or for simultaneous use in a double monochromator. The support elements define a plane parallel to the film plane insuring that in reversible or scanning use both film surfaces will maintain a desired relation in a scanning or reversible spectrometric system. When the two film surfaces are on a single glassy blank or contained between light transmissive glassy blanks of different refractive indices, different blaze wavelengths appear outside the blanks at each side of the grating without changing the spectral dispersion.

3,698,796

OBJECTIVE CONSISTING OF FIVE LENS MEMBERS

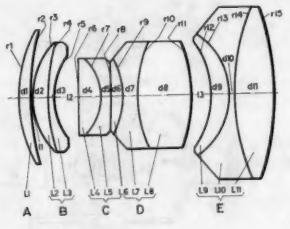
Ludwig Bertele, Heerbrugg, Switzerland, assignor to Firma Wild Heerbrugg AG, Heerbrugg, Switzerland, a part interest

Filed March 15, 1971, Ser. No. 124,276

Claims priority, application Switzerland, March 17, 1970, 4037/70

Int. Cl. G02b 9/34, 9/60

U.S. Cl. 350—216 **2 Claims**



An objective consisting of five lens members. The first two lens members are menisci curved towards the object, the first lens member having collective refractive power and the second lens member being composed of at least two separate lenses. The third and fourth lens members have a collective effect and consists of several individual lenses. The fifth lens member is a meniscus with dispersive refractive power, cemented from several separate lenses and curved towards the image. The invention contemplates that the third lens member includes a cemented surface curved towards the image and of stronger curvature than the other cemented surfaces in this lens member, the refractive index n_d of the lens adjoining this surface on the image side being smaller than the lens adjoining it on the object side, while the opposite relationship applies as regards the Abbe numbers γ of these lenses.

3,698,797

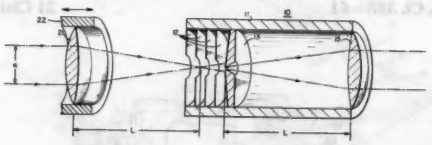
LASER OUTPUT ATTENUATOR

Ray B. Brown, Upper Marlboro; Frederick R. Fluhr, Oxon Hill, both of Md., and George L. Hall, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 27, 1970, Ser. No. 31,894

Int. Cl. G02f 1/30

U.S. Cl. 350—266 **4 Claims**



This disclosure is directed to a wide range laser power attenuator which uses suitable optical lenses in combination with a pinhole and suitable absorption baffles to control a laser beam as desired. The system operates without causing any degradation of coherence and polarization properties of the laser beam.

3,698,798

REAR VIEW MIRROR FOR AUTO BUMPERS

Lawrence Bolton, Route 2, Box 63, Cody, Wyo.

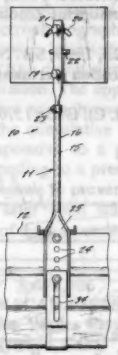
Filed Feb. 11, 1971, Ser. No. 114,565

Int. Cl. B60r 1/08

U.S. Cl. 350—307 **1 Claim**

A rear bumper mounted mirror to aid in backing a vehicle from a curb into traffic, the device comprising a mirror at-

tached to the upper end of a rod, the lower end of the rod having a clamp unit for attachment to a rear bumper of an automotive vehicle. The mirror at the upper end of the rod is pivotably adjustable and securable in a preferred adjusted



position so that a motorist can either turn his head and look into the mirror or adjust a rear vision mirror of the vehicle and without turning his head thus see the rear bumper mounted mirror.

ERRATUM

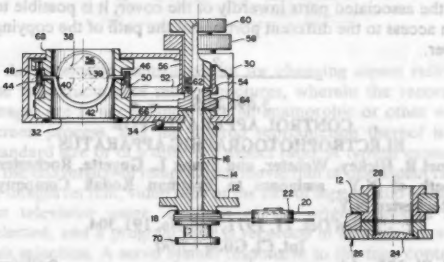
For Class 351—6 see:
Patent No. 3,698,099

3,698,799

CROSS CYLINDER FLIP MECHANISM

Richard L. Pitchford, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 22, 1971, Ser. No. 165,218
Int. Cl. A61b *3/02, 3/08*
U.S. Cl. 351—28 **11 Claims**



In an ophthalmic refractor improved cross cylinder flip mechanism comprises a cross cylinder lens rotatably mounted in a loupe by means including a pinion meshed with a face gear, the latter being rotatable to achieve a flip, rotation of the face gear being actuated from a handgrip located adjacent the cylinder lens axis control knob, thereby minimizing the attention which a practitioner must give to frequent shifts of his hand from one such handgrip to the other.

3,698,800

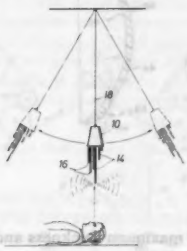
VISUAL AND AUDIO PERCEPTION TESTING AND TRAINING APPARATUS

Frank A. Belgau, P.O. Box 936, La Porte, Tex.

Filed Feb. 16, 1971, Ser. No. 115,548
Int. Cl. A61b *3/00*; A61h *5/00*
U.S. Cl. 351—32 **4 Claims**

Visual and audio perception testing and training apparatus comprising a satellite or tracking member of hollow construction provided with sound producing means for use as a source of audio signals and also having visual target means for testing visual perception.

Means is provided for movably supporting the tracking member for movement along predetermined paths for visual



observation and for testing the user's audio perception.

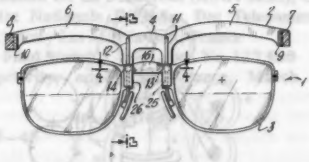
The apparatus may include visual and audio signal producing target means and missle means for use therewith to be used for testing audio and visual perception or for amusement purposes.

3,698,801

SPECTACLES WITH ADJUSTABLE LENSES

Alan A. Masucci, 1910 University Avenue, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,913
Int. Cl. G02b *7/06*
U.S. Cl. 351—55 **2 Claims**



Spectacles with adjustable lenses which include a frame with extended arms and bridge, the bridge having gear-track means for holding fast a lens chassis capable of assuming a plurality of positions relative to frame. The lens chassis includes a pair of lenses and a bridge structure supporting said lens, the bridge structure including a shaft having rotatable gears at its extremities for movement along said frame gear-track and in confinement therewith. The lens chassis permits different viewing area of the lens to be exposed when the chassis is moved along said gear-track.

3,698,802

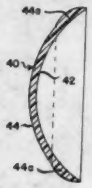
HYDROPHILIC CONTACT LENS

Henry J. Baron, 52 S. Oakland Avenue, Sharon, Pa.

Continuation-in-part of Ser. No. 687,240, Dec. 1, 1967, abandoned, and a continuation-in-part of Ser. No. 736,124, June 11, 1968, abandoned, and a continuation-in-part of Ser. No. 736,149, June 11, 1968, abandoned. This application Dec. 29, 1969, Ser. No. 888,293
Int. Cl. G02c *7/04*
U.S. Ci. 351—160 **3 Claims**

A contact lens for use on a human eye formed from a gel-like hydrophilic polymeric material. The lens has a generally spherical concave inner surface which conforms to the curved

surface of the cornea when positioned thereon and an outer peripheral surface portion tapering from a thin edge to an in-



termediate point of maximum thickness and then tapering to the center of the lens.

3,698,803

CAMERA FOR TAKING HEMISPHERICAL MOTION PICTURE

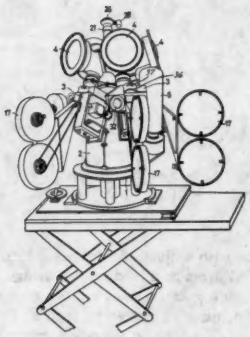
Toshio Watanuki, Tokyo, Japan, assignor to The Midori-Kai Co., Ltd., Minamiku, Osaka, Japan

Filed March 15, 1971, Ser. No. 124,378

Claims priority, application Japan, Sept. 9, 1970, 45/79789; Sept. 9, 1970, 45/79790; Sept. 9, 1970, 45/79791; Sept. 9, 1970, 45/79792; Sept. 9, 1970, 45/79793

Int. Cl. G03b *37/00, 37/04*

U.S. Cl. 352—69 **5 Claims**



A camera for taking hemispherical motion pictures includes a plurality of cinecamera units provided with wide-angle lenses and arranged radially so that each cinecamera unit can cover within its picture angle each segment of an overall view around and above said camera. Disposed at the center of the arrangement of the cinecamera units is a center rotary shaft to be driven by a motor for synchronized rotation and carrying a main bevel gear. Each cinecamera unit has a torque delivery shaft extending toward the center rotary shaft and carrying a driven bevel bear meshing with the main bevel gear. Each cinecamera unit is further provided, on its side face, with a viewfinder for enabling the operator to view an erect image. A monitoring fish-eye lens is disposed above and centrally of the arrangement of the cinecamera units and at the image forming side of the fish-eye lens there is disposed a television camera tube which is connected to a monitoring television receiver.

3,698,804

PHOTOCOPYING MACHINE HAVING REMOVABLE MODULES

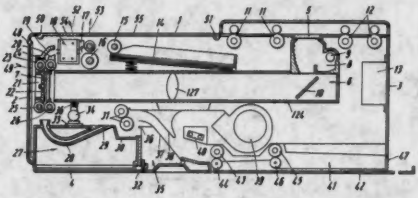
Georg Cranskens, Wedel/Holstein; Gunther Krober, Hamburg-Rahlstedt, and Richard Palm, Hamburg, all of Germany, assignors to Lumoprint Zindler KG, Hamburg, Germany

Filed April 23, 1969, Ser. No. 818,522

Claims priority, application Germany, April 26, 1968, P 17 72 296.2

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **10 Claims**



A copying apparatus is contained within a housing and includes a charging unit, a surface element for positioning individual sheets of copying paper in an exposure station, and a developing device containing developing media. A number of pairs of rollers are positioned in the housing for conveying individual sheets of copying paper through the copying apparatus. The housing includes a number of openable covers, preferably hinged to the housing, for gaining access to the interior of the apparatus. Each pair of rollers has one driven roller secured within the housing and the other roller is movably mounted within the housing. Relative to the housing, the driven rollers are spaced inwardly from the movably mounted rollers. By opening the covers on the housing, the charging units, surface element and developing device can be removed from the housing along with the movably mounted rollers associated with them for affording access to the driven rollers. The path of the copying paper through the housing has a U-shaped configuration with the legs of the U extending horizontally. By opening the covers in the housing and removing the associated parts inwardly of the cover, it is possible to gain access to the different portions of the path of the copying paper.

3,698,805

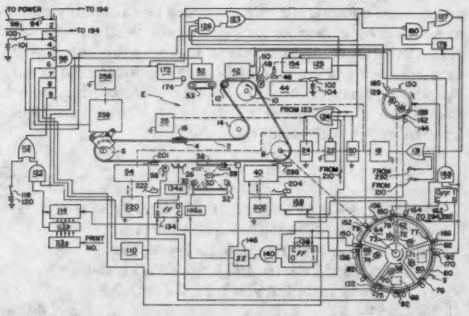
CONTROL APPARATUS FOR ELECTROPHOTOGRAPHIC APPARATUS

Lionel R. Hickey, Webster, and Frank L. Guyette, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,304

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **8 Claims**



An electrophotographic copying apparatus having an electrophotographic web movable along an endless path relative

to a plurality of actuable work stations disposed along the path and wherein each of the work stations is operative when actuated to perform a work operation on the web. The apparatus includes a sequencer for sequentially producing, (a) a plurality of control signals, each such control signals for causing particular ones of the electrophotographic stations to perform work operations on the web in timed relation to web movement respectively, and (b) a count signal each time a selected station performs its operation. The apparatus further includes counter means responsive to each count signal and having a state which manifests the cumulative total number of count signals, and means responsive to a particular state of the counter means corresponding to a predetermined cumulative total number of count signals to prevent the further actuation of each work station after each station has performed a predetermined number of work operations.

3,698,806

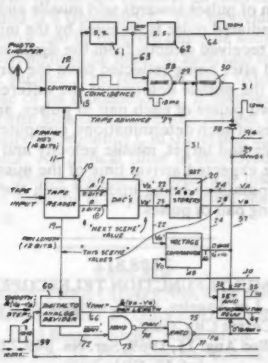
PAN SCAN SYSTEM

Lewis P. Reitz, Jr., Palos Verdes Estates, Calif., assignor to Technicolor, Inc., Hollywood, Calif.

Filed Aug. 20, 1970, Ser. No. 65,510

Int. Cl. G03b *27/52*

U.S. Cl. 355—40 **18 Claims**



An automatic control system for changing aspect ratio in the reproduction of motion pictures, wherein the recorded images are in accordance with an anamorphic or other wide screen process, and the desired reproduction thereof is of standard size or of a different aspect ratio. A typical example is the conversion of images from movie film of one aspect ratio to images on film, video tape or the like of aspect ratio suitable for television usage. Portions of the original images are selected, and a program tape is recorded in accordance with this selection. A servo system responsive to the tape controls the reproduction, such as by a film printer. Signals from the tape are used to control the selection of the portions of original film frames and indicate a start position and an end position of the scan of the original, as well as indicate the frame length of the scan. A film gate or other device of a film printer, for example, is operated by the servo system, and is moved from position to position to select and allow exposure of the preselected portions of the original film for printing.

3,698,807

DISPLAYING AND PRINTING APPARATUS

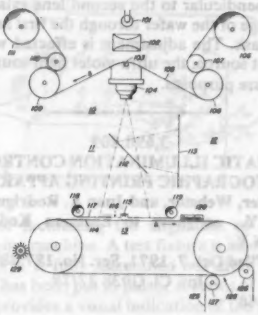
John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1971, Ser. No. 108,297

Int. Cl. G03b *13/28*

U.S. Cl. 355—45 **17 Claims**

Apparatus in which graphic information is simultaneously displayed and reproduced. Images of material on microfilm are projected toward a photoreceptor consisting of an electrostatically charged photoconductive element, to form an electrostatic latent image which is later developed. The optical path from the original material to the photoreceptor is intercepted by an image-splitting dichroic reflector or interference filter, which reflects a spectral portion of the image to a viewing screen. After passing through the reflector the unreflected spectral portion impinges on the charged photoreceptor to



form the latent image. The reflector or filter is chosen so that the wavelength range of the light passing through it corresponds to the range of maximum sensitivity of the photoreceptor. To scan the image a shield having a slit moves laterally across the photoreceptor; adjacent to the slit and immediately preceding it is a charging unit to charge the photoreceptor before exposure.

3,698,808

OPTICAL MASKING DEVICE

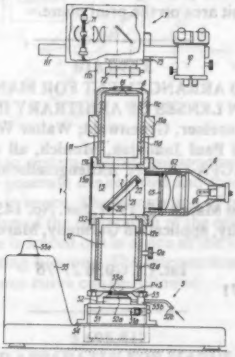
Jean R. Delmas, Vanves, France, assignor to Agence Nationale De Valorisation De La Recherche (A.N.V.A.R.), Courbevoie and Centre Nationale D'Etudes Des Telecommunications (C.N.E.T.), Issey Les Moulineaux, France

Filed March 1, 1971, Ser. No. 122,630

Claims priority, application France, March 6, 1970, 7008153

Int. Cl. G03b *13/26*

U.S. Cl. 355—45 **7 Claims**



The device is intended for optically masking a photosensitive layer on a wafer by means of a mask. It comprises a first and a second lens each having a large numerical aperture and separated by a gap. A mask holder is located in the focal plane of the first lens located on its side opposite that of the gap, and a wafer holder in the focal plane of the second lens located on its side opposite that of the gap. A source of ultraviolet radiation produces a beam aligned with the first lens axis and a source of visible light produces a beam rectangular to said

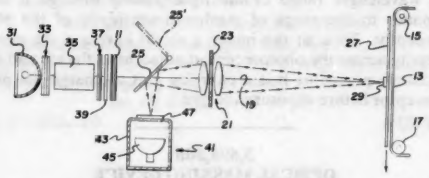
axis. A semireflecting plane member located in the gap provided between the two lenses and at 45° on the axis of the first lens transmits one of the beams and reflects the other beam along the second lens axis. A first possible arrangement is such that the semireflecting member is in a space where both beams are made of parallel rays. In another possible arrangement, a concave mirror reflecting the light transmitted through the first lens and the semireflecting member is provided. Position adjustment means are provided for shifting the wafer holder in the plane perpendicular to the second lens axis and superimposing the image of the wafer through the first and second lenses and the mask. The adjustment is effected with the aid of the visible light source, the ultra-violet light source being used for photogravure purposes.

3,698,809

AUTOMATIC ILLUMINATION CONTROL FOR PHOTOGRAPHIC PRINTING APPARATUS

James E. Harter, Webster, and Juan A. Rodriguez, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,480
Int. Cl. G03b 27/78
U.S. Cl. 355—68 **8 Claims**



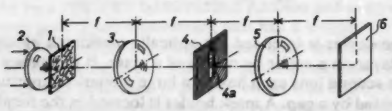
Photographic printing apparatus includes a reference light source and a mirror with the mirror adapted to be moved into the normal projection path of the apparatus to reflect light from the reference light source through the printing lens and onto the print plane. A photocell in the print plane detects the light from the reference light source and effectively compares it with a reference potential to thereby control the opening of a diaphragm in the printing lens to maintain a constant illumination per unit area on the print plane.

3,698,810

METHOD AND ARRANGEMENT FOR MANUFACTURING DIFFUSION LENSES OF ARBITRARY INDICATRIX

Friedrich Bestenreiner, Gruenwald; Walter Weiershausen, Ottobrunn, and Paul Janovjak, Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 15, 1971, Ser. No. 145,080
Claims priority, application Germany, March 14, 1970, P 20 12 191.9
Int. Cl. G03b 27/76
U.S. Cl. 355—71 **12 Claims**



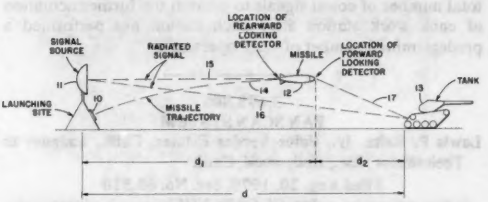
Diffusion lens with desired light intensity distribution manufactured photographically by recording an image of an illuminated diffusing lens of standard characteristic after spacial frequency filtering of the light of said lens.

3,698,811

DISTANCE RANGING SYSTEM

William M. Weil, Southfield, Mich., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed Dec. 18, 1970, Ser. No. 99,429
Int. Cl. G01c 3/08; F41g 7/00
U.S. Cl. 356—5 **10 Claims**



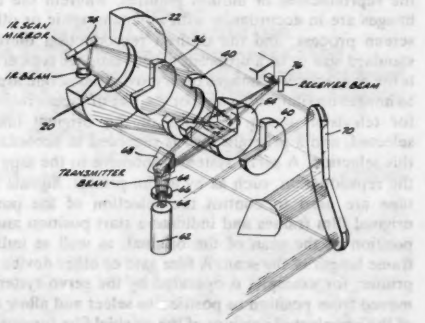
A missile is traveling from its launch point towards an intended target. A signal source, located near the launch point, radiates a train of pulses towards said missile and towards said target. Each radiated pulse is received by the missile as a pair of pulses, one received directly from the signal source and the other received after being reflected from the target. Computing means on the missile determines the difference in arrival times of the two pulses of each pair of pulses, and then, from successive ones of such determinations, computes the distance between missile and target, missile velocity and acceleration, and finally the expected arrival time of the missile at the target; said computations being updated with the reception of each succeeding pair of pulses.

3,698,812

MULTI-FUNCTION TELESCOPE

Harry Nelson, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 11, 1969, Ser. No. 849,220
Int. Cl. G01c 3/08
U.S. Cl. 356—5 **9 Claims**



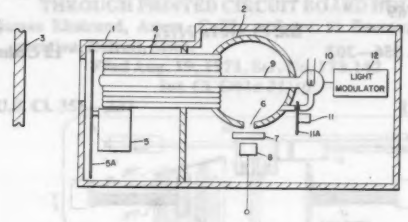
A telescope which simultaneously receives a plurality of frequency-distinguishable radiation transmissions from an object and which coaxially transmits one of said frequencies through a single aperture. The apparatus essentially consists of a double Cassegrainian telescope including an apertured primary objective reflecting mirror, an apertured secondary mirror and a filter element disposed between said mirrors for passing radiation at one of said frequencies through the aperture in the primary mirror and for reflecting radiation at a second of said frequencies through the aperture in the secondary mirror.

3,698,813

EMISSIVITY CORRECTED OPTICAL PYROMETER

Sol Aisenberg, Natick, Mass., assignor to Whittaker Corporation, Waltham, Mass.

Filed Jan. 18, 1971, Ser. No. 106,980
Int. Cl. G01j 5/52, 5/62
U.S. Cl. 356—48 5 Claims



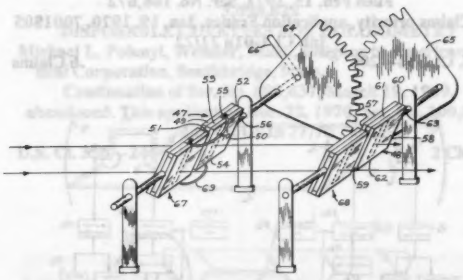
An optical pyrometer for measuring true surface temperature utilizes a spherical light integrator having a reflective internal surface. Light from the subject surface, in traveling an optical path into the spherical integrator, is modulated at a frequency f_e. The pyrometer employs an internal light source that is modulated at a frequency f_L. The modulated light from the internal source can be directed onto the subject surface to permit a measurement to be made to ascertain the reflectance of the subject surface. The reflected light from the internal source, because of its modulation f_L, is distinguishable from the light otherwise emanating from the subject surface which is modulated only at frequency f_e in traversing the optical path to the integrator. An optical filter is employed to filter the light emerging from a port in the spherical integrator and a photo-sensitive detector is disposed to have the filtered light incident upon it.

3,698,814

ABERRATION-FREE COMPENSATOR FOR USE IN WHITE LIGHT INTERFEROMETRY

John B. Clark, 3203 Runkle Street, Niles, Mich.

Filed Jan. 25, 1971, Ser. No. 109,167
Int. Cl. G01b 9/02
U.S. Cl. 356—107 7 Claims



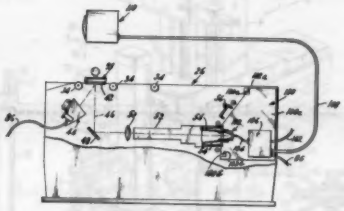
An aberration-free compensator for use in white light interferometry is provided in which anomalous fringe shifts characteristic of the difference in refractive dispersion between the two limbs of the interferometer are eliminated. The compensator is designed so that the sole difference in light paths through the compensator elements in the two limbs of the interferometer is through a fluid medium having a refractive dispersion which is substantially identical to that of the material being studied in the interferometer. Use of such a fluid medium compensator permits changing the refractive dispersion thereof without substantially rebuilding the interferometer.

3,698,815

EXPOSURE LAMP ALIGNMENT EQUIPMENT

Herbert Thomas, Miami, Fla., assignor to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed Nov. 20, 1970, Ser. No. 91,269
Int. Cl. G01j 1/100
U.S. Cl. 356—121 43 Claims



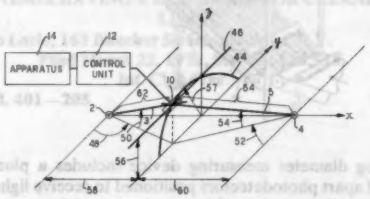
Apparatus for facilitating the alignment of the exposure lamps in a copying machine. A test fixture is insertable in each machine before it is fully assembled but after the exposure lamp assembly has been put in place. A series of photocell-actuated meters provides a visual indication of the light intensity pattern at the exposure window, the lamp assembly being adjusted by an operator until uniform meter readings are observed. By aligning each assembly after it is mounted in a machine, rather than pre-aligning each assembly and then placing it in a machine, misalignments which arise during assembly are eliminated. The test fixture itself includes a self-calibration unit.

3,698,816

LASER GUIDANCE SYSTEM

Milton Lutchansky, Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 16, 1970, Ser. No. 72,749
Int. Cl. G01s 1/44, 3/02
U.S. Cl. 356—152 1 Claim



A laser guidance system utilizes two synchronized rotating laser beacons to generate desired two and three-dimensional reference curves in space. The orientation of one beacon is a prescribed function of the orientation of the other beacon and a reference curve is traced out in space as the loci of intersections of the rotating beacons. The intersections are detected so that the reference curve can be followed.

3,698,817

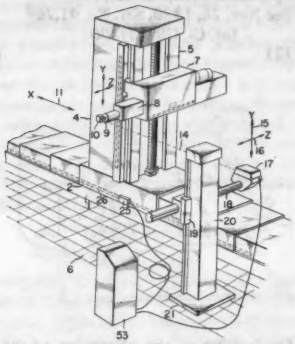
METHOD AND APPARATUS FOR MANUFACTURING REFERENCE SCALES

Kazuo Iimura; Kiyoshi Sawada, and Hiroki Kato, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 8, 1970, Ser. No. 96,211
Int. Cl. G01b 11/00
U.S. Cl. 356—156 4 Claims

In a method of manufacturing a reference scale for use in a machine tool or a measuring machine having a numerically

controlled positioning or position indicating device, a magnetic blank of a scale is secured to the machine, the quantity



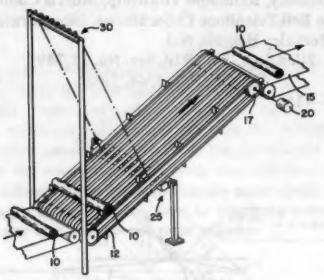
of movement of a movable member of the machine is measured by a laser beam length measuring device and the measured quantity is magnetically graduated on the blank.

3,698,818

LOG DIAMETER SCANNER INCLUDING A PLURALITY OF PHOTODETECTORS

John F. Bowker, Linnwood, and Warren H. Odegard, Seattle, both of Wash., assignors to The Black Clawson Company, Hamilton, Ohio

Filed April 27, 1971, Ser. No. 137,846
Int. Cl. G01b 11/10
U.S. Cl. 356—160 **7 Claims**



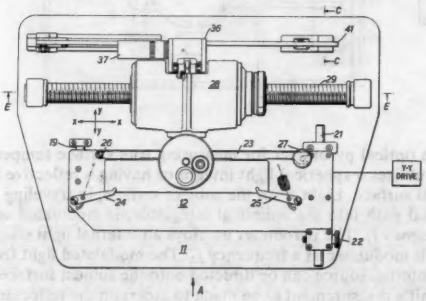
A log diameter measuring device includes a plurality of spaced apart photodetectors positioned to receive light from a corresponding number of lamps. A conveyor transports logs or veneer blocks between the photodetectors and the lamps with the log axis parallel thereto. A tachometer pulse generator attached to the conveyor supplies pulses for predetermined increments of log movement, and gate circuits are employed to gate these tachometer pulses into counters during the time that the photodetectors are darkened due to the presence of the log. One counter circuit accumulates pulses representing the average number of photodetectors darkened for each tachometer pulse and thus contains a number representing the average diameter of the log. Another counter circuit is employed to count the number of tachometer pulses which occur when all of the photodetectors are darkened, thus representing the diameter of the maximum right cylinder contained within the log. An augmenting circuit may be used to provide pulses to this last counter representing the minimum diameter of the log at any of the locations sensed by the photodetectors. A paper tape perforator is employed to record permanently the information stored in the counters for each log, and this information may then be used to determine the actual volume of useable wood entering a veneer mill.

3,698,819

SCANNING LIGHT DETECTORS

Roy Causer, Wantage; John Farren, Abingdon; Terence Leslie Jones, Wantage; Brian Leslie Taylor, Newbury, and Ronald Kerry Webster, North Oxford, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed March 5, 1970, Ser. No. 16,677
Claims priority, application Great Britain, March 7, 1969, 12,315/69
Int. Cl. G01n 21/22
U.S. Cl. 356—203 **12 Claims**



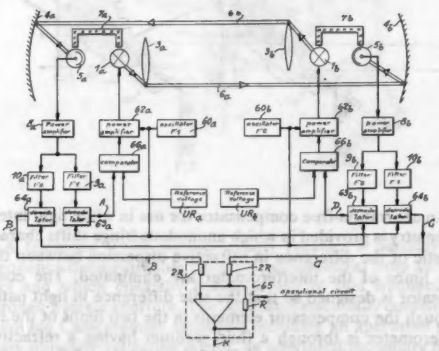
For analyzing the exposed grain density of a photographic plate, light is shone through the plate onto a detector. A stepping motor drives a temperature compensated lead screw and nut arrangement to move the plate and light/detector relatively and give an automatic position indication. The detector output pulses define a time interval inversely proportional to the light intensity falling upon the detector. Drive stepping is automatically initiated upon completion of detector read out.

3,698,820

APPARATUS FOR MEASURING THE TRANSMISSIVE POWER OF THE ATMOSPHERE EMPLOYING TWO TRANSMITTERS AND RECEIVERS

Michel Max Hanff, Bailly, and Stephane Chambolle, Paris, both of France, assignors to Compagnie des Compteurs, Paris, France

Filed Feb. 15, 1971, Ser. No. 106,672
Claims priority, application France, Jan. 19, 1970, 7001805
Int. Cl. G01n 21/22
U.S. Cl. 356—206 **6 Claims**



Process and device for measuring the transmissive power of the atmosphere wherein, on one hand, each transmitter is under control, so that the signals received from said transmitter by the associated respective receiver are kept at a con-

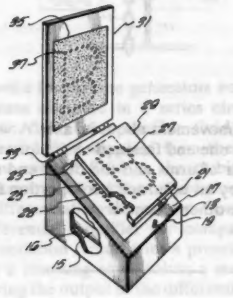
stant value and, on the other hand, the signals having passed through the atmosphere and received from the remote transmitter, by each receiver, are applied to an operational circuit performing their half-sum, the output of which is characteristic of the transmissive power.

3,698,821

METHOD AND APPARATUS FOR INSPECTING PLATED-THROUGH PRINTED CIRCUIT BOARD HOLES

James Ekstrand, Azusa, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 19, 1971, Ser. No. 173,142
Int. Cl. G01n 21/16
U.S. Cl. 356—237 19 Claims



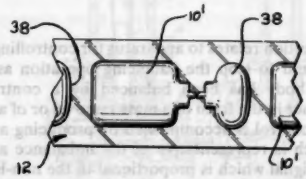
In testing plated-through holes in finished circuit boards, light from a light source is introduced into the light-conducting substrate of a printed circuit board but is prevented from entering the plated-through holes of the substrate by a hole masking template. A light detector senses light in the holes, such light having entered through a defective hole wall from the substrate. In an alternate embodiment, light from a light source is channeled into the plated-through holes in a light-conducting substrate, but prevented from entering the substrate by a substrate masking template. A light detector senses light emanating from the substrate adjacent to a hole, such light having entered the substrate, from the hole, through a defective hole wall.

3,698,822

DISPOSABLE CUVETTES FOR COLORIMETRY

Michael L. Polanyi, Webster, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 808,437, March 19, 1969, abandoned. This application Dec. 22, 1970, Ser. No. 100,810
Int. Cl. G01n 21/16
U.S. Cl. 356—246 2 Claims



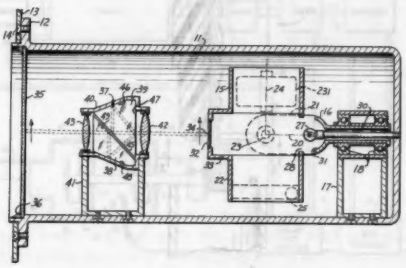
Colorimeter cuvettes in the form of sealed transparent flexible plastic envelopes containing or adapted to receive samples of substances to be colorimetrically analyzed. Means are provided for introducing sample reagents into the envelopes. Mixing of the envelope contents may be effected by kneading prior to testing and the flexibility of the cuvettes allows for adjustment of optical path lengths therethrough.

3,698,823

ATTITUDE INDICATING INSTRUMENT

Robert W. Reynolds, Los Angeles, and George P. Wight, Simi, both of Calif., assignors to Clary Corporation, San Gabriel, Calif.

Filed July 6, 1970, Ser. No. 52,383
Int. Cl. G01c 19/34
U.S. Cl. 356—250 4 Claims



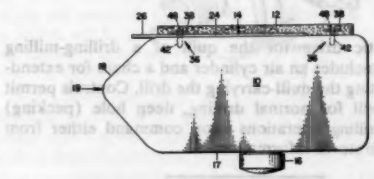
A gyroscopically controlled artificial horizon indicating device for aircraft having a light mask carried by the gimbal means of the gyroscope, the mask having a slit forming a representation of the aircraft. An image of the slit is projected onto a translucent window by an optical system including a prism effective to invert the projected image of the slit in an upright plane relative to the aircraft but does not revert such image in a lateral plane. A horizon representing line on the window provides a reference for determining the relative position of the projected image and therefore the attitude of the aircraft.

3,698,824

SPONGE HAVING A RESERVOIR FOR CLEANING LIQUID

Angelo Lorio, 161 Bleecker Street, Brooklyn, N.Y.

Filed March 22, 1971, Ser. No. 126,510
Int. Cl. A47l 13/17
U.S. Cl. 401—205 1 Claim

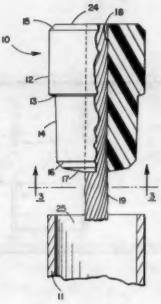


A sponge is attached to a hand-manipulated fluid reservoir and a finger-manipulated valve is disposed between the sponge and the reservoir for selectively controlling the flow of fluid. The sponge is secured to the reservoir by means of locking studs carried by straps disposed in slots provided in the sponge.

3,698,825
ARRANGEMENT FOR PREVENTING LEAKAGE FROM BALL-POINT PEN CARTRIDGES

Hartley M. Sears, Laguna Beach, and Clarence O. Schrader, Santa Ana, both of Calif., assignors to Frawley Enterprises, Inc., Los Angeles, Calif.

Filed May 21, 1971, Ser. No. 145,745
Int. Cl. B43k 7/02
U.S. Cl. 401—217 11 Claims

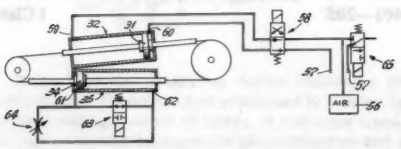


An arrangement for preventing leakage from a tubular ink cartridge including a plastic body having a frustoconical portion wedged into the end of the ink cartridge with a string extending axially through the center of the plastic body providing a plurality of small passageways, which allow air to flow into the cartridge but prevent ink from flowing outwardly, a number of the plug elements being producible simultaneously by extending a string through the cavities of a multiple-cavity mold and molding the plastic bodies around the string, with the plug elements subsequently being separated by severing the string.

3,698,826
AUTOMATIC ACTUATOR FOR A DRILLING MACHINE

Paul D. Henderson, Avon, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 10, 1971, Ser. No. 141,846
Int. Cl. B23b 47/22
U.S. Cl. 408—17 6 Claims



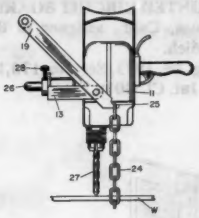
An automatic drive for the quill of a drilling-milling machine that includes an air cylinder and a chain for extending and retracting the quill carrying the drill. Controls permit cycling the drill for normal drilling, deep hole (pecking) drilling and milling operations upon command either from manual or from stored information.

3,698,827
ATTACHMENT FOR PORTABLE DRILLS

Donald G. Salfer, Route 1, New Avon Township, Minn.

Filed March 16, 1971, Ser. No. 124,811
Int. Cl. B23b 47/18
U.S. Cl. 408—92 2 Claims

A device for applying pressure to a portable power drill for feeding the drill tool into a work piece is formed by a sleeve which can be detachably secured to the steadying handle of the drill. The sleeve is carried between a first pair of parallel lever arms which are mounted between and pivoted to a second pair of longer lever arms having a handle for applying pressure. The sleeve is mounted in apertures, formed in two spaced plates secured to and between the first pair of lever

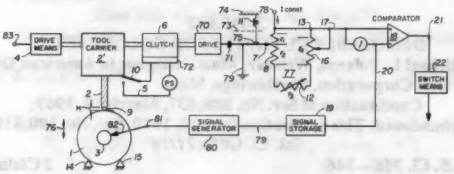


arms, for turning movement about its axis. A work piece embracing chain has one end fastened to the forward end of one of the second pair of arms and the other end adapted to be releaseably held by an upturned hook portion formed on the forward end of the other second arm.

3,698,828
APPARATUS FOR CONTROLLING A BALANCING MACHINE

Otfrid Maus, Langen; Martin Mueller, Bickenbach, and Robert Mueller, Darmstadt, all of Germany, assignors to Carl Schenck Maschinenfabrik GmbH, Postfach, Germany

Filed Oct. 26, 1970, Ser. No. 83,821
Claims priority, application Germany, Dec. 27, 1969, P 19 65 090.9
Int. Cl. B23b 39/04
U.S. Cl. 408—11 18 Claims

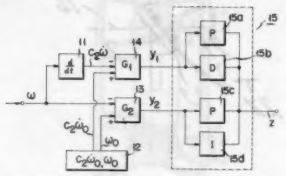


This invention relates to apparatus for controlling balancing machines and to stop the balancing operation as soon as a rotational body has been balanced by a controlled mass change either in the form of a mass removal or of a mass addition. Said control is accomplished by producing an electrical signal which is representative of the imbalance and another electrical signal which is proportional to the non-linear variation of the effect of said controlled mass change. The latter signal is produced by a two terminal parallel network including a potentiometer the tap of which is adjusted in response to the instantaneous mass change. The two terminal network is connected to means for evaluating, for example comparing, the two signals to produce a control signal which, for example through a relay, stops a tool performing said balancing operation.

3,698,829
CONTROL DEVICE FOR TURBINE GENERATORS

Moritada Kubo, and Yasuo Shinomiya, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 12, 1971, Ser. No. 105,806
Int. Cl. H02p 9/04
U.S. Cl. 415—36 2 Claims

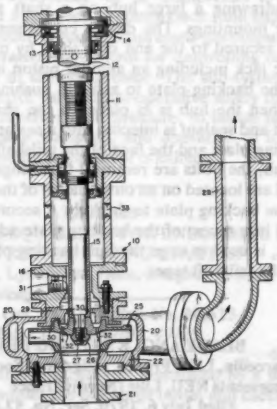


A control device for turbine generators comprising adjustment valve means disposed in a series circuit including a source of elastic fluid (compressible fluid) and a turbine generator driven by fluid supplied from the source so as to control the flow rate of fluid to the turbine; a revolution counter for measuring the number of rotations of the turbine; a circuit for differentiating the output from the revolution counter; a differential amplifier for comparing the output from the differentiation circuit with a preset reference valve and generating a resulting error valve; a second differential amplifier receiving the output of the differentiation circuit and a second reference value and generating an error value and a P.I.D. control circuit receiving the outputs from said differential amplifiers for generating a control output including to control the adjustment valve and in consequence the acceleration of the turbine.

3,698,830
VERTICAL CENTRIFUGAL SUCTION PUMP

Thomas S. Goyne, Ashland, Pa., assignor to Goyne Pump Company

Filed Feb. 2, 1971, Ser. No. 111,870
Int. Cl. F01d 11/00
U.S. Cl. 415—111 6 Claims

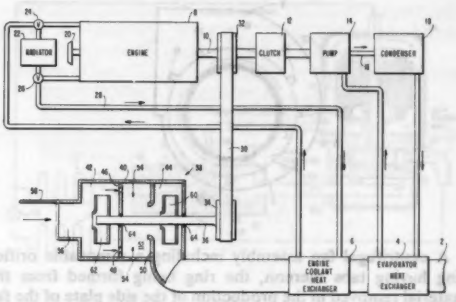


A vertical bottom suction pump for static thickners and the like having a cantilevered shaft and sealed by means of water or fluid being passed behind the impeller and out a discharge tap located above the fluid level.

3,698,831
AIR SUPPLY DEVICE FOR AIR HEATING AND COOLING SYSTEM

Wilson C. Shepheard, P.O. Box 7245, Norfolk, Va.

Filed Oct. 12, 1970, Ser. No. 79,930
Int. Cl. F01d 5/14
U.S. Cl. 415—115 1 Claim

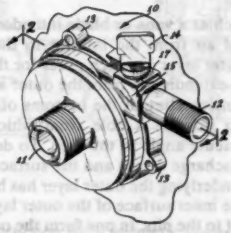


A two-stage blower is driven by a liquid-cooled engine. The first stage of the blower operates in a chamber divided from an intake plenum for the second stage by an orifice plate. For heating, a starvation damper for the first stage chamber is opened, heat is added to the air and its potential energy is reduced to substantially zero by the orifices which the air passes through to the second stage. For cooling, the starvation damper is closed, the first stage runs idle, and intake air for the second stage is drawn directly from the atmosphere to the second stage.

3,698,832
PUMP IMPELLER HOUSING WITH INTEGRAL FLOW REGULATOR

Carl Price, 17821 Twilight Lane, Encino, Calif.

Filed June 18, 1970, Ser. No. 47,460
Int. Cl. F04d 27/00, 25/06; F15d
U.S. Cl. 415—148 2 Claims



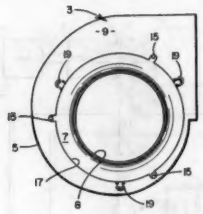
An impeller or rotor housing having an integral provision for selectively regulating the flow of fluid from a centrifugal or axial-flow fluid pump. A baffle mounted on the housing is selectively interposed and removed from the path of fluid. The baffle is sized and shaped in accordance with the design limits of the particular pump it is installed on whereby the rate of fluid flow when the baffle is in its maximum flow restricting position will be sufficient to prevent damage and erosive wear to the pump as a result of overloading the motor, heat or running dry.

3,698,833

CENTRIFUGAL FAN

Peter L. Cann, and Richard J. Duell, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed March 31, 1971, Ser. No. 129,717
Int. Cl. F04d *1/00, 29/40*
U.S. Cl. 415—201 **4 Claims**



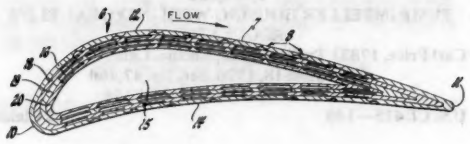
A centrifugal fan assembly including a removable orifice ring having tabs thereon, the ring being formed from the material removed in the production of the side plate of the fan housing, the diameter of the orifice ring being substantially equal to the diameter of the opening in the side plate of the fan housing, the tabs on the orifice ring being utilized to locate the orifice ring on the side plate of the fan housing.

3,698,834

TRANSPIRATION COOLING

George B. Meginnis, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1969, Ser. No. 879,110
Int. Cl. F01d *5/18*
U.S. Cl. 416—96 **11 Claims**



An airfoil such as a vane or blade intended to be cooled by transpiration of air from the interior to the exterior of the blade has an outer layer in which pores for the cooling air are defined by pits extending in from the outer and inner faces of the layer and intersecting at the bottoms of the pits, the pits being offset to provide a hole from which flow tends to proceed at an acute angle to the face. To decrease the angle between the discharge of gas and the surface of the airfoil, a control sheet underlying the outer layer has holes to supply air to the pits in the inner surface of the outer layer which are offset with respect to the pits. In one form the outer layer is composed of two laminations each having holes entirely through the laminations which are then bonded together with the holes offset to provide the general type of structure defined by the offset intersecting pits in a single sheet or lamination.

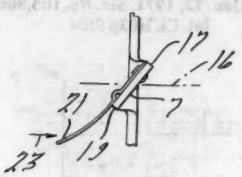
3,698,835

FAN CONSTRUCTION

John C. Kelly, 1320 Kathmar, Jackson, Mich.

Filed Feb. 1, 1971, Ser. No. 111,586
Int. Cl. F04c *29/36*
U.S. Cl. 416—132 **7 Claims**

A fan construction suitable for cooling internal combustion engines has flexible blades clamped on the inside faces of the spider arms, each blade having a hinge section in the form of a tapered bead or corrugation extending along its length with the concave part of the bead facing the spider arm so that both longitudinal edges of the bead engage the arm over a substantial portion of the length of the blade.

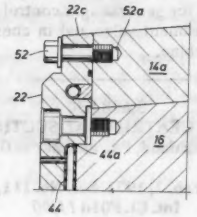


3,698,836

HUB INSTALLING RETAINING AND WITHDRAWING DEVICE AND METHOD

Bernard S. Herbage, 7520 Hornwood, Apt. 904, Houston, Tex.

Filed March 9, 1970, Ser. No. 17,523
Int. Cl. B63h *1/20*
U.S. Cl. 416—146 **37 Claims**



A device and method for the purpose of installing, retaining, and withdrawing a large hub on a shaft such as in ship's propeller mountings. The device comprises a backing plate which is secured to the end of a shaft by means of bolts. A hydraulic jack including an annular piston is mounted in the face of the backing plate to assist in pushing the hub on the shaft. When the hub is in place on the shaft, the bolts are tightened and sealant is injected into a sealant recess between the backing plate and the face of the tailshaft. For withdrawal of the hub, the bolts are removed from engagement with the shaft and are located on an outer flange of the backing plate to secure the backing plate to the hub. A second hydraulic jack, mounted in a recess of the backing plate adjacent the end of the shaft, is used to urge the hub backing plate assembly aftward of the tailshaft taper.

3,698,837

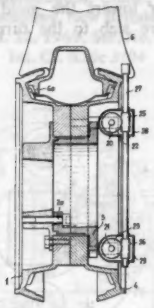
BLADE ANGLE SETTING DEVICE

Louis Marcellin, Lille, France, assignor to Societe Anonyme des Etablissements NEU, Lille (Nord), France

Filed July 6, 1970, Ser. No. 52,479
Claims priority, application France, Dec. 19, 1969, 6944292
Int. Cl. F04d *29/36*
U.S. Cl. 416—208 **3 Claims**

Device for adjusting in the inoperative condition the angular setting of all the blades of a helical wheel of a fan, which comprises a hub rigid with one of the two rims clamping the blade roots, said rims being adapted to revolve in relation to

each other and having their respective positions irreversibly interconnected through one or a plurality of screw-threaded rods extending through straps carried by said rims.



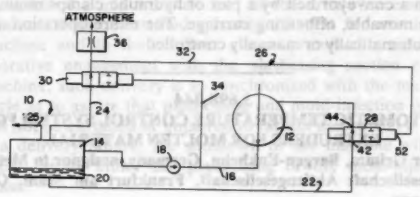
The rotation of said rods is obtained by means of tools engaging a radially extending shaft and connected through a swivel joint or a worm and gear drive to said rods.

3,698,838

AUTOMATIC FLUID SUPPLY AND CONTROL MEANS

John E. Holdsworth, and Dallas M. Weir, both of Mocksville, N.C., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,479
Int. Cl. F04b *39/04, 39/06*
U.S. Cl. 417—228 **11 Claims**



For a system having a gas compressor and a compressed-gas receiver through-connected by a compressor-to-receiver discharge line and a receiver-to-compressor fluid supply line, and in which the receiver has a compressed-gas output line, an automatically-operative sub-system for controlling oil supply from the receiver to the compressor. The sub-system means include a flow-control valve signal-operative solely from fluid power, i.e., from receiver fluid pressure, to insure oil supply when the compressor starts up, and operative to insure oil supply cut-off when the compressor is halted.

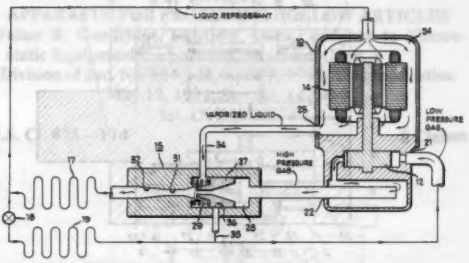
3,698,839

PRESSURE EQUALIZER FOR UNLOADING A COMPRESSOR DURING START-UP

John F. Distefano, Lyndhurst, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 14, 1970, Ser. No. 80,613
Int. Cl. F04b *49/02, 49/08*
U.S. Cl. 417—299 **6 Claims**

A pressure equalization passage, controlled by a normally open valve, intercouples the discharge outlet and suction inlet of a motor-driven compressor anytime the compressor is inoperative. With an equalized pressure across and therefore no load on the compressor, the starting torque requirement for the motor will be minimized. Upon and responsive to compressor operation, the valve closes and interrupts the passage to segregate the discharge outlet and suction inlet from each other. This is achieved by a spring-biased axially movable nozzle in the discharge line from the compressor, which nozzle serves as a movable valve member. When the compressor operates, fluid flow in the nozzle creates a pressure differential resulting in a force which moves the nozzle in opposition to its spring bias and to an operating position effective to close a vent in the equalization passage. In response to termination of fluid flow, occurring when the compressor ceases operation,



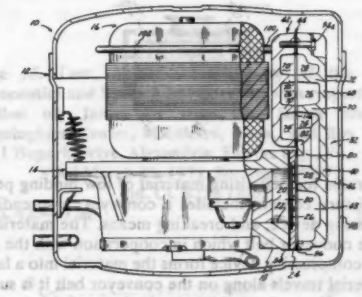
the nozzle returns to a home position under the influence of its spring bias and unblocks the vent. In one application of the invention where the compressor pumps fluid in a closed series flow path, the nozzle also functions as the nozzle section of a jet pump which entrains or syphons fluid, previously diverted from the flow path and used for compressor motor cooling, back into the discharge line.

3,698,840

COMPRESSOR MUFFLER CONSTRUCTION

Paul B. Hover, Clinton, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 26, 1971, Ser. No. 147,146
Int. Cl. F04b *21/00, 39/00;* **F01n** *1/08, 7/10*
U.S. Cl. 417—312 **18 Claims**



A muffler construction for a hermetic compressor wherein the muffler is made up of half-shell body and cover members connected together with their open ends facing one another and having matching ribs arranged at an acute angle to the gas flow path between the inlet and outlet of the muffler. The surfaces of the juxtaposed peripheral walls and ribs adjacent the open end of each member are coplanar. A flat sealing gasket is disposed between the members coextensive with the juxtaposed surfaces of the peripheral walls of the members. Hence, the gasket serves to space the juxtaposed surfaces of the ribs a predetermined distance apart to thereby define wide and thin flow passages successively communicating the muffler chambers formed by the transverse ribs and associated side and end walls of the members.

3,698,841

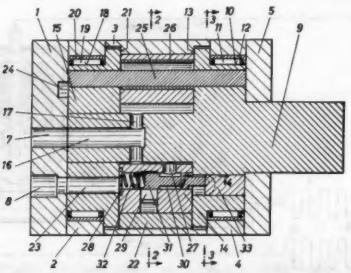
HYDRAULIC MOTOR

Gavril T. Luszlig, Haledon, N.J., assignor to Webster Electric Company, Racine, Wis.

Division of Ser. No. 850,937, Aug. 18, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 100,186

Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*

U.S. Cl. 418—61 **13 Claims**



Positive displacement hydraulic motor employing planetary mechanism and using pins placed in offset holes for coupling the orbiting member to the shaft; valve assemblies and control parts with inclined end faces which control the flow of fluid into and out of sets of expansible chambers, and vanes for delimiting the expansible chambers.

3,698,842

PELLETISING APPARATUS

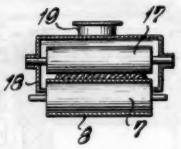
Wilhelm Eirich, Waldurner Str. 41, and Gustav Eirich, Bahnhofstr. 19, both of Hardheim Nordbaden, Germany

Filed July 27, 1970, Ser. No. 58,433

Claims priority, application Switzerland, Aug. 6, 1969, 11936/69

Int. Cl. B29b *1/02, 5/00*

U.S. Cl. 18—1 B **19 Claims**



Apparatus for pelletising material of low binding power or low moisture content includes a conveyor, a spreading and compressing device, and breaking means. The material is fed onto the conveyor belt which in cooperation with the spreading and compressing device forms the material into a layer. As the material travels along on the conveyor belt it is subjected to heat exchange for solidifying the layer. Subsequently the layer is broken up into pellets.

3,698,843

HIGH PRODUCTION ISOSTATIC MOLDING DEVICE

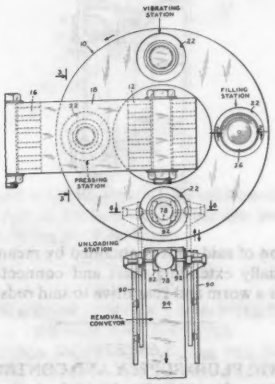
Arnold G. Bowles, and Neil Follette, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Filed Feb. 24, 1971, Ser. No. 118,384

Int. Cl. B28b *3/00*

U.S. Cl. 425—86 **12 Claims**

A high production isostatic press comprising a revolving turntable which supports elastomeric molds, each mold resting on a closure slab. The molds are filled with compactible material from a hopper while being simultaneously vibrated. The table rotates each filled mold, in turn, beneath the open end of a cylindrical, upright isostatic press. A hydraulic ram lifts each filled mold and closure slab, one at a time, from the turntable into the press where the material is compacted by fluid pumped into the press under high pressure. The closure slab seals the open end of the press during the compacting. The ram thereafter lowers the mold with its compacted material and closure slab to the turntable. The turntable



rotates the compacted material and mold to an unloading stage where the mold is lifted clear of the compact and closure slab by a set of mechanical fingers. The compact is placed upon a conveyor belt by a pair of hydraulic clamps mounted on a movable, offbearing carriage. The entire operation may be automatically or manually controlled.

3,698,844

AUTOMATIC TEMPERATURE CONTROL SYSTEM FOR EXTRUDERS FOR MOLTEN MATERIAL

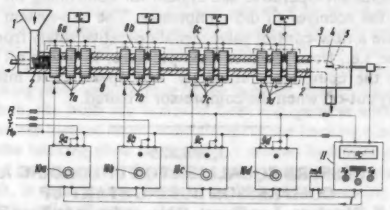
Peter Grimm, Bergen-Enkheim, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 24, 1970, Ser. No. 58,010

Claims priority, application Germany, Aug. 1, 1969, P 19 39 248.4

Int. Cl. B29f *1/00*

U.S. Cl. 425—144 **3 Claims**



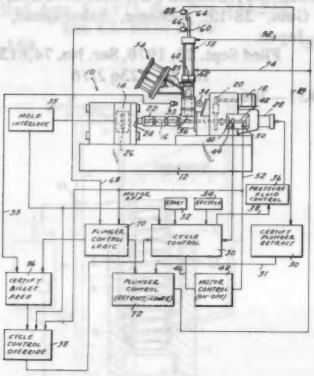
Automatic temperature control system for extruders having a plurality of heating zones which includes an electronic controller for controlling the electric heating power supplied to each zone, a temperature sensing device adapted to supply a signal to the controller representing the temperature of molten metal at the extruder head. The controller is in communication with all the heating zones and is adapted to control thyristor-type active networks associated with the respective heating zones which regulate the electric heating power supplied to each zone in a pre-set adjusted ratio.

3,698,845

PLASTICS INJECTION-MOLDING MACHINE UTILIZING PREMIXED BILLETS

Donald C. Paulson, Southington, Conn., assignor to The New Britain Machine Company, New Britain, Conn.

Filed Oct. 22, 1969, Ser. No. 868,303
Int. Cl. B29c *3/04*
U.S. Cl. 425—145 18 Claims



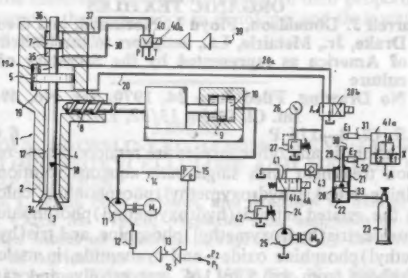
The disclosure contemplates the selective supplying of a premixed plastic article of a predetermined composition into the plasticizing or melt-producing section of a plastics injection-molding machine. Means are provided to sense the presence of a minimum amount of the article necessary to produce a predetermined quantity of melt for use in the machine and to then deliver a new premixed article into operative engagement with the plasticizing section of the machine; such delivery is so synchronized with the machine cycle as to assure that plasticizing and mold-injection phases will not be curtailed or impaired to further assure that if there is a delivery failure, the shutdown of the machine will not occur during either the plasticizing or the mold-injection phase.

3,698,846

BALANCING AND ADJUSTING ARRANGEMENT FOR AN EXTRUSION MANDREL

Volkmar Leutner, Hemmingen, Germany, assignor to Indramat, Gesellschaft fur Industrie-Rationalisierung und Automatisierung GmbH, Lohr/Main, Germany

Filed April 29, 1971, Ser. No. 138,671
Claims priority, application Germany, April 30, 1970, P 20 21 219.5
Int. Cl. B29d *23/04*; B29f *3/06*
U.S. Cl. 425—149 15 Claims



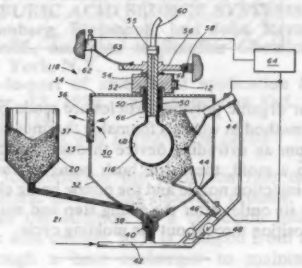
Material, particularly synthetic plastic material, extruded through an annular gap between the mouth of an extrusion head and a mandrel, exerts a forward force on the mandrel. In order to facilitate adjustment of the gap, which requires movement of the mandrel in the rearward direction, a rearward acting balancing force is applied to the mandrel, preferably produced by a pressure fluid supplied to a cylinder chamber, and acting on a balancing piston secured to the mandrel. When the balancing force is equal to the forward force, adjustment of the mandrel requires only a small force.

3,698,847

APPARATUS FOR PRODUCING HOLLOW ARTICLES

Walter R. Goodridge, Fairfield, Conn., assignor to Electrostatic Equipment Corporation, Stratford, Conn.

Division of Ser. No. 814,121, April 7, 1969. This application May 12, 1971, Ser. No. 142,460
Int. Cl. B29h *5/24*
U.S. Cl. 425—174 8 Claims



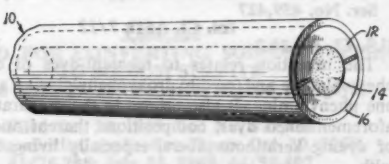
A generally hollow article is produced by coating a collapsible, seamless bladder with integrable particles, integrating the particles into a unitary structure, and thereafter removing the bladder therefrom. The apparatus includes coating means to form a fluidizing mass the particles, means for acting upon the bladder to promote adhesion, and means for integrating the particles on the bladder into a hollow article. The bladder is normally non-adherent to the particles, and is comprised of at least one material that is responsive to the adhesion promoting means.

3,698,848

EXTRUSION CAN

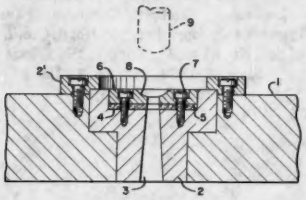
George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; James G. Hunt, 85 Salem End Lane, Framingham Center, Middlesex, Mass., and Roy W. Rice, 5411 Hopark Drive, Alexandria, Fairfax Cty., Va.

Filed March 29, 1971, Ser. No. 129,073
Int. Cl. B23b *1/00*
U.S. Cl. 425—176 11 Claims



An extrusion can for use in extruding ceramics under heat and pressure, characterized by a metallic, tubular wall defining a cylindrical body adapted to receive therewithin a ceramic billet to be co-extruded therewith. A particular feature of the extrusion can resides in multiple pairs of adjacent surfaces defining within the tubular wall a plurality of elongated slots extending substantially the length of the body and having deposited therein a filler of a type adapted to preclude welding of the adjacent surfaces as a co-extrusion of the can and billet is achieved.

3,698,849
INJECTION MOLDING ASSEMBLY
Jan Czerski, Crewe, England, assignor to Shell Oil Company, New York, N.Y.
Filed April 8, 1969, Ser. No. 814,365
Claims priority, application Great Britain, April 11, 1968, 17,521/68
Int. Cl. B29f *1/022*
U.S. Cl. 425—247 1 Claim

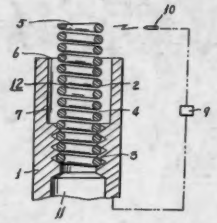


Cellular organic polymer articles are made by an injection molding method in which a foamable thermoplastic melt is injected from an extruding device through a nozzle and sprue bush into a mold, the sprue bush being thermally insulated from the injection nozzle and the nozzle being closed at a position near its outlet after the filling step and maintained in injection position throughout the molding cycle.

3,698,850
PROMOTION OF BURNING OF OIL SLICKS WITH PARTICULATE, FOAMED ALKALI METAL SILICATES
Derry D. Sparlin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Continuation-in-part of Ser. No. 132,547, April 8, 1971, abandoned. This application March 8, 1972, Ser. No. 232,923
Int. Cl. E02b *15/04*
U.S. Cl. 431—8 4 Claims

Particles of foamed water soluble and dispersible alkali metal silicates are distributed over oil slicks to absorb the oil. The oil is then burned after which the water soluble and dispersible particulate foamed alkali metal silicate particles solubilize and disperse.

3,698,851
GAS BURNER NOZZLE FOR USE IN A GAS LIGHTER
Kenjiro Goto, 28-13, 5-chome, Sakurajosui, Setagaya-ku, Tokyo, Japan
Filed Sept. 23, 1970, Ser. No. 74,613
Int. Cl. F23q *2/16*
U.S. Cl. 431—266 6 Claims



A gas burner construction incorporating a cylindrical body and a spiral member. The spiral member desirably extends beyond the upper end of the cylindrical body and defines a main gas outlet. The individual coils of the spring are slightly spaced so that a portion of the gas flow passing through the spring will be forced through these spaces thereby forming, with the atmospheric air with which it becomes intermixed, a readily ignitable gas-air mixture adjacent the main gas outlet.

CHEMICAL

3,698,852
AMINO ACID/PHENYLAMINE REACTANT-DYES FOR KERATINOUS FIBERS AND LIVING HAIR
Myron Pantzer, Englewood, and Milton Feier, Tenafly, N.J., assignors to Apod Corporation, Englewood, N.J.
No Drawing. Continuation-in-part of applications Ser. No. 701,313 and Ser. No. 701,352, both Dec. 9, 1957, and Ser. No. 135,433, Sept. 1, 1961, and Ser. No. 147,123, Oct. 16, 1961. Said applications Ser. No. 135,433 and Ser. No. 147,123 are continuations-in-part of applications Ser. No. 701,350 and Ser. No. 701,351, both Dec. 9, 1957, all abandoned. This application May 27, 1965, Ser. No. 459,427
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.2 19 Claims

The invention relates to reactant-dyes of dihydroxyphenylalanine and/or dihydroxyphenylglycine and at least one phenylamine. It also relates to the preparation of the aforementioned dyes, compositions thereof and methods of dyeing keratinous fibers, especially living hair therewith.

3,698,853
FRAY RESISTANT CATGUT SUTURES
Barrie Alexander Wilson, Sylvania, New South Wales, Australia, assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Oct. 31, 1969, Ser. No. 873,073
Int. Cl. A61l *17/00*; A63b *51/02*; D01f *5/00*
U.S. Cl. 8—94.11 6 Claims

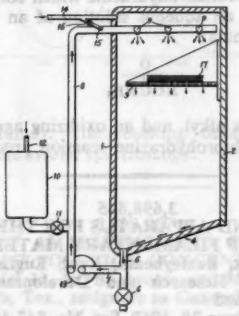
Absorbable catgut sutures prepared by twisting one or more plies or collagen split from animals intestines have an improved run-down, improved resistance to fraying, improved adhesion between the plies and better resistance to unravelling when prepared by soaking the gut strings in an aqueous gelatin solution just before twisting the plies to form the strings, particularly if the collagen is chromed before twisting.

3,698,854
PROCESS FOR PRODUCING FLAME RESISTANT ORGANIC TEXTILES
Darrell J. Donaldson, Floyd L. Normand, and George L. Drake, Jr., Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed June 24, 1970, Ser. No. 49,556
Int. Cl. D06m *13/32, 13/38*
U.S. Cl. 8—116 P 6 Claims

Cellulosic and other textiles are rendered flame resistant upon treatment with single-bath aqueous solutions containing tetrakis(hydroxymethyl)phosphonium chloride—or the related tetrakis(hydroxymethyl)phosphonium hydroxide, tris(hydroxymethyl)phosphine, and tris(hydroxymethyl)phosphine oxide—and cyanamide, in mole ratios of about from 1:0.5 to 1:4, respectively, and catalyzed preferably by a phosphorus-containing compound, such as phosphoric acid, ammonium phosphate, chloromethylphosphonic acid, and sodium phosphate. The solutions are applied to various fabrics by the pad-dry-cure technique,

and the treatments are found to be durable to innumerable laundering cycles. The finish contained the added quality of wrinkle resistance.

3,698,855
GARMENT DYEING PROCESS
John Anthony Sutton, Chorlton-cum-Hardy, England, assignor to Courtaulds Limited, London, England
Filed Apr. 5, 1971, Ser. No. 131,554
Int. Cl. B05c *5/00*
U.S. Cl. 8—150 6 Claims



A process for dyeing a garment, or garments, which term includes garment blanks or garment panels, comprising laying out the garment, or a stack of the garments, on a shelf located within a pressure vessel and feeding, for example spraying, a heated dye liquor onto the upper surface of the garment, or of the uppermost garment, while the interior of the vessel is at superatmospheric pressure. Apparatus for carrying out the process is also described and claimed.

3,698,856
TREATMENT OF TEXTILE FIBERS
Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Continuation-in-part of application Ser. No. 282,815, May 23, 1963. This application Nov. 22, 1966, Ser. No. 596,063
Int. Cl. C08f *15/18*
U.S. Cl. 8—115.5 28 Claims

Acryloyl or methacryloyl chloride is co-polymerized with a fluoroalkyl ether or ester, for example, 1,1-dihydroperfluorooctyl acrylate. The copolymers are applied to textile materials, e.g., wool, to improve their properties, for example, their resistance to shrinking, and their water- and oil-repellency.

3,698,857
FIBROUS CROSSLINKED (AMINOALKYL)AMINOCHLORODEOXYCELLULOSE AND METHOD OF PREPARATION
Tyrone L. Vigo, New Orleans, and Matthew F. Margavio and Clark M. Welch, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Jan. 26, 1971, Ser. No. 109,964
Int. Cl. D06m *13/00, 13/34, 13/54*
U.S. Cl. 8—116.2 24 Claims

The preparation of cellulosic yarns and fabrics having 0.67%–11% of the cellulosic hydroxyl groups replaced by chlorine atoms, and a further 0.33%–7% of the hydroxyl groups replaced by (aminoalkyl)amino groups, in addition to appreciable cellulose crosslinking, leads to textiles of increased wrinkle resistance in the wet state, enhanced affinity for acid dyes, and increased resistance to cellulose solvents. The cellulosic textile is first converted to chlorodeoxycellulose in textile form, by reaction with thionyl chloride in dimethylformamide at 20°–30° C., and is subsequently treated with an aliphatic polyamine dissolved in a straight-chain alcohol of 3–6 carbon atoms at 90°–130° C., to replace some of the chlorine atoms by (aminoalkyl)amino groups.

3,698,858
PROCESS OF INHIBITING CORROSION IN SPENT SULFURIC ACID SLUDGE SYSTEMS
Carl E. Stromberg, Richmond, and John Reynolds, El Cerrito, Calif., assignors to Stauffer Chemical Company, New York, N.Y.
Continuation-in-part of abandoned application Ser. No. 27,555, Apr. 13, 1970. This application Oct. 6, 1971, Ser. No. 187,119
Int. Cl. C01b *17/92*; C23f *11/04*
U.S. Cl. 21—2.5 3 Claims

A system for reducing the corrosion rate on metals in a spent sulfuric acid sludge recovery process. This system comprises the addition of a corrosion inhibitor to spent sulfuric acid sludges, as it is pumped from a storage medium through a heat exchanger to maintain these sludges at a constant temperature. The corrosion inhibitors consist of water or water in the form of dilute fresh sulfuric acid.

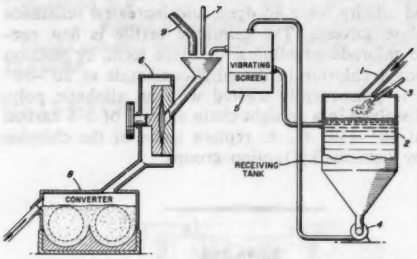
3,698,859
PROCESS FOR PREPARING A COPPER CHROMITE CATALYST
Terrance J. Velten, Glen Burnie, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed June 23, 1971, Ser. No. 156,110
Int. Cl. C01g *3/00, 37/00*
U.S. Cl. 23—56 6 Claims

An active copper chromite hydrogenation catalyst is prepared in essentially a three-step process using basic copper carbonate, chromic acid, ammonium hydroxide, an ammonium carbonate. The result is the formation of a basic copper ammonium chromate intermediate which is subsequently decomposed by calcination to copper chromite. A distinct advantage of the process is that environmental contamination is minimized, with carbon dioxide being essentially the only effluent which is vented. Liquid waste by-product is essentially non-existent.

3,698,860
METHOD FOR CONVERTING SODIUM SULFIDE TO SODIUM SULFITE
Kaoru Shiba 29–22, 1-chome, Higashi Yukigaya, Ota-ku, Tokyo, Japan
Filed Oct. 28, 1969, Ser. No. 871,930
Claims priority, application Japan, Oct. 30, 1968, 43/78,788; July 25, 1969, 44/58,407
Int. Cl. C01d *5/00, 5/14*
U.S. Cl. 23—129 8 Claims

A process for converting sodium sulfide in the smelt resulted from the burning of black liquor from digesters of semichemical pulp and sulfite pulp to sodium sulfite by oxidation and recovering the latter as pulp digesting chemical, which comprises mixing the smelt particles with water, adding thereto a minor amount of sodium hydroxide forming the mixture into particles and introducing

the particles into a converter packed with dry powder of sodium sulfite, sodium carbonate, etc., containing no sodium sulfide, the process being performed throughout as a wet process.



3,698,861

HYDROLYSIS OF ALUMINUM ALCOHOLATES

Peter Pascoe, Moers, Friedrich Josten, Rheinkamp-Utfort, Wilhelm Haferkamp, Moers, and Willi Lucker, Homberg, Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,830
Claims priority, application Germany, Jan. 22, 1969, P 19 03 066.1
Int. Cl. C01f *7/36*
U.S. Cl. 23—143 6 Claims

Aluminum alcoholates especially those containing aliphatic hydrocarbon radicals of at least 4 carbon atoms are hydrolyzed in the presence of a solvent such as benzene using 3–4 moles of water per mole of alcoholate at a temperature below 80° C.

3,698,862

METHOD FOR THE STORAGE AND SHIPMENT OF WET PROCESS PHOSPHORIC ACID

Jatinder Jolly, Metairie, La., assignor to Freeport Sulphur Company, New York, N.Y.

No Drawing. Filed July 17, 1970, Ser. No. 55,944
Int. Cl. C01b *25/18, 25/22*
U.S. Cl. 23—165 19 Claims

The undesirable sludge which typically accumulates in shipped or stored wet process phosphoric acid is rendered flowable by the presence in the phosphoric acid of a polymer selected from the group consisting of polyacrylamides, hydrolyzed polyacrylonitriles and salts thereof, and polyethylene oxide, these polymers being present in an amount effective to render the sludge flowable. The flowability of the sludge facilitates unloading of the acid from the shipping or storage vessel in addition to providing other advantages to a shipper of the acid.

3,698,863

FIBROUS METAL FILAMENTS

John A. Roberts, North Chelmsford, and Peter R. Roberts, Groton, Mass., assignors to Brunswick Corporation

Continuation-in-part of application Ser. No. 742,010, July 2, 1968, now Patent No. 3,505,039, and a division of application Ser. No. 348,326, Mar. 2, 1964, now Patent No. 3,394,213. This application Jan. 29, 1970, Ser. No. 6,709
The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed
Int. Cl. H01b *1/02, 5/02*
U.S. Cl. 29—183.5 28 Claims

A metallic filament which has an effective diameter of less than 50 microns and is formed while surrounded by a subsequently removed sacrificial matrix. The filament has a preselected peripheral surface varying from substantially smooth to re-entrant and a preselected surface to volume ratio. The area of the filament also has a controlled non-uniformity along the length thereof which provides an acceptable dimensional tolerance. The metallic filament may be substantially one metal, bimetallic or tubular.

3,698,864

SYNTHESIS OF TETRAFLUOROHYDRAZINE

Vytautas Grakauskas, Arcadia, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Filed May 28, 1969, Ser. No. 828,743
Int. Cl. C01b *21/52*
U.S. Cl. 23—205 4 Claims

This patent describes a novel process for the in situ preparation of tetrafluorohydrazine which comprises passing fluorine into an aqueous solution of an alkyl carbamate of the formula:

$$RO\overset{O}{\overset{\|}{C}}NH_2$$

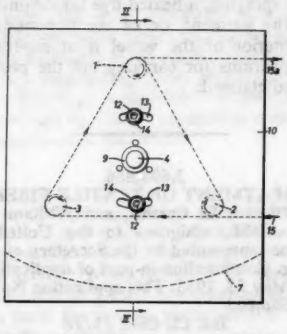
wherein R equals alkyl, and an oxidizing agent, and collecting the tetrafluorohydrazine reaction product.

3,698,865

METHOD AND APPARATUS FOR THE TREATMENT OF FILAMENTARY MATERIAL

Jozef Zbrzezniak, Bexleyheath, Kent, England, assignor to Morganite Research and Development Limited, London, England

Filed June 30, 1969, Ser. No. 842,432
Claims priority, application Great Britain, July 3, 1968, 31,685/68
Int. Cl. C01b *31/07;* D06c *7/04*
U.S. Cl. 23—209.1 3 Claims



For the production of carbon filaments of high tensile strength and modulus of elasticity, a method and apparatus is provided for feeding a continuous thread of filamentary material in a helical path around a roller cage which is enclosed in a furnace for continuous pyrolysis treatment of the thread.

3,698,866

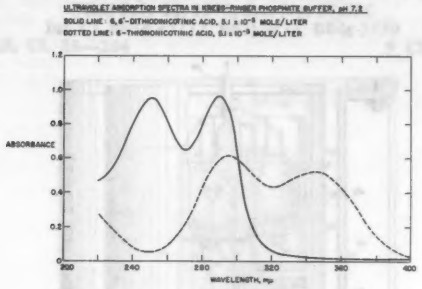
SPECTROPHOTOMETRIC METHOD AND REAGENTS FOR QUANTITATIVE DETERMINATION OF THIOLS

Davide R. Grassetti, Berkeley, and John F. Murray, Jr., San Lorenzo, Calif., assignors to Arequipa Foundation, San Francisco, Calif.

Application July 31, 1969, Ser. No. 850,686, which is a continuation-in-part of abandoned application Ser No. 777,005, Nov. 19, 1968. Divided and this application May 24, 1971, Ser. No. 146,556
Int. Cl. C07d *51/36;* G01n *21/06, 21/20*
U.S. Cl. 23—230 R 8 Claims

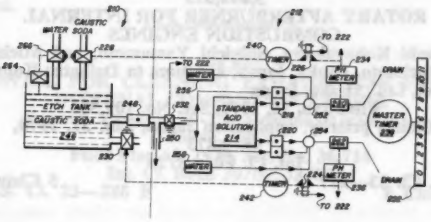
A method for the quantitative determination of thiol presence in a sample which includes mixing the sample

with a dithiobisheterocyclic reagent, such as 6,6'-dithiodinicotinic acid, 2,2'-dithiodiquinoline or 2,2'-dithiobis-(6-


ULTRAVIOLET ABSORPTION SPECTRA IN KREBS-RINGER PHOSPHATE BUFFER, pH 7.2
SOLID LINE: 6, 6'-DITHIODINICOTINIC ACID, 5.1 x 10⁻⁵ MOLE/LITER
DOTTED LINE: 6-THIONONICOTINIC ACID, 5.1 x 10⁻⁵ MOLE/LITER
ABSORBANCE
WAVELENGTH, mμ

methylpyrimidine). The resulting thione derivative is detected by ultraviolet spectroscopy.

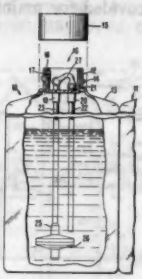
3,698,867
METHOD OF ANALYZING AND CONTROLLING ETCHANT SOLUTION CONCENTRATIONS
Ewald J. Bielefeld, Jr., Benbrook, and Maurice J. Puma, Fort Worth, Tex., assignors to General Dynamics Corporation
Original application Oct. 9, 1968, Ser. No. 766,161. Divided and this application Mar. 29, 1971, Ser. No. 129,257
Int. Cl. C23f *1/08*; G05d *11/08*; G01n *31/16*
U.S. Cl. 23—230 A 3 Claims



A method and apparatus for the automatic monitoring, analyzing and controlling of the etch rate and chemical concentration of a chemical milling solution responsive to pH values at first and second equivalence points for both caustic soda and inhibitor.

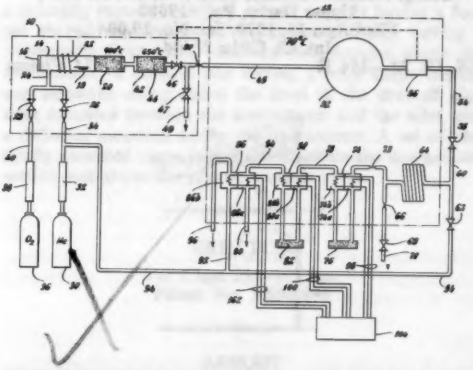
3,698,868
DISPENSER FOR SUPPLYING LIQUID BY SUCTION
Theodore Bilichniansky, Hopewell Junction, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Original application Feb. 11, 1970, Ser. No. 10,548. Divided and this application May 20, 1971, Ser. No. 145,147
Int. Cl. G01n *1/14*
U.S. Cl. 23—230 R 6 Claims

A dispenser including a container body having a mouth. A permanent liquid seal across the mouth has a pair of ducts approaching the bottom of the container and opening thereinto. The ducts extend upwardly through the seal, having their upper ends spaced apart. Before use, a short length of flexible tubing interconnects the upper ends of the ducts to prevent leakage and spillage. One end of the tubing may be disconnected and then connected to a suction inlet so that the connected one of the pair of ducts becomes an aspirating tube and the other provides



an air inlet. Multiple container bodies may be supported together.

3,698,869
ANALYSIS OF GASEOUS MIXTURES
Richard D. Condon, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 20, 1965, Ser. No. 481,341
Int. Cl. G01n *27/18, 31/06, 31/12*
U.S. Cl. 23—232 R 10 Claims

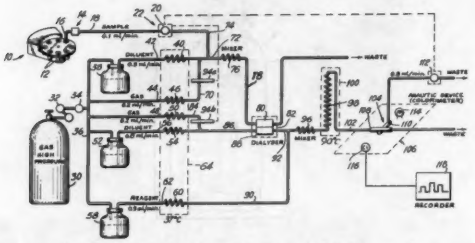


A self-integrating CHN analyzer operating at superatmospheric pressure with improved water measurement capabilities. The organic sample is burned in oxygen and the products of combustion are forced into a reservoir by a carrier gas. A portion of the reservoir contents are then permitted to escape to atmosphere through an elongated delay volume where a portion is retained and water equilibrium is established. Thereafter, carrier gas displaces the retained portion at a constant pressure head through measuring cells responsive to water, carbon dioxide, and nitrogen.

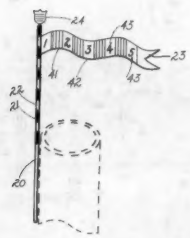
3,698,870
APPARATUS FOR PUMPING WITH VISCOSITY CONTROL
Eduard B. M. de Jong, Tilburg, Netherlands, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Continuation-in-part of application Ser. No. 712,431, Mar. 12, 1968. This application Mar. 2, 1971, Ser. No. 120,153
Int. Cl. B67d *5/54*; F04f *1/00*; G01n *31/00*
U.S. Cl. 23—253 R 10 Claims

A pump system for sample analysis apparatus including an analytical conduit of relatviely low fluid-flow resistance and which is subject to variations in resistance and having

an end coupled to either end of a second conduit to either receive from or supply to the analytical conduit a fluid caused to flow through both conduits. The second conduit has a relatively high resistance to fluid flow, and temperature control is provided for maintaining the high resistance portion of the second conduit at a substantially constant temperature for precluding variations in the resistance thereof and in the viscosity of the fluid passing through it, so that the rate of flow along the analytical conduit is maintained substantially constant.



3,698,871
AIR POLLUTION DETECTORS
George Andrew Brennan, 7100 West Chester Pike, Upper Darby, Pa. 19082
Filed Apr. 16, 1970, Ser. No. 29,004
Int. Cl. G01n *21/04*
U.S. Cl. 23—254 R 11 Claims

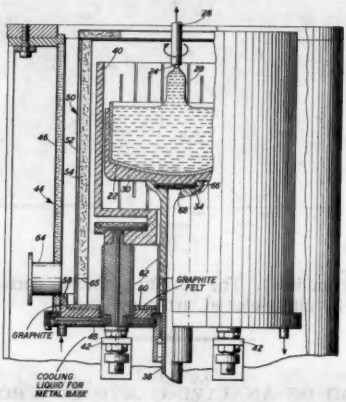


An easily seen, standardized surface, such as that of a mast, mounted in the effluent discharging from a potential source of air pollution, such as a chimney, to provide a visible surface on which can be accumulated an informative record of the condition of the effluent, since the device was installed.

3,698,872
BREAKOUT PROTECTION FOR CRYSTAL GROWERS
Raymond E. Reusser, Bethlehem, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Dec. 28, 1970, Ser. No. 101,567
Int. Cl. B01j *17/18*
U.S. Cl. 23—273 SP 1 Claim

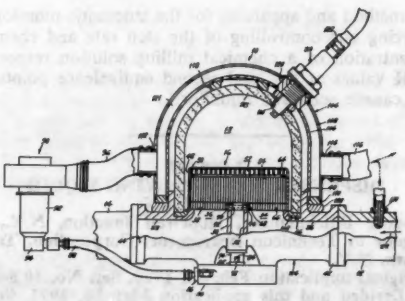
A chamber formed around a heated susceptor and crucible in a crystal grower is constructed to provide protection against molten silicon in the event of breakage of the susceptor or crucible. The bottom of the chamber has a layered construction. A fluid cooled metallic plate forms the lowermost layer of the chamber. The plate is covered by a layer of solid graphite and the solid graphite is covered by a layer of felt.

In the event of a "breakout" of molten silicon, the graphite felts absorbs the molten material and the solid graphite transfers heat from the graphite felt to the fluid cooled plate, thus rapidly cooling the mass of molten material to solidify it and prevent further spreading thereof.



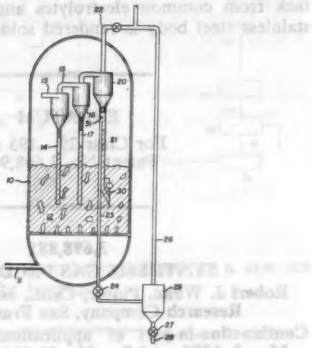
Additionally, a temperature-sensing passageway leading to the susceptor is capped at the susceptor end thereof with a disc of silicon-resistant graphite to prevent molten silicon from running into the passageway.

3,698,873
ROTARY AFTERBURNER FOR INTERNAL COMBUSTION ENGINES
Takashi Kohayakawa, Shinichi Yamamoto, and Michio Morimoto, Osaka, Japan, assignors to Daihatsu Kogyo Co., Ltd., Osaka, Japan
Filed Jan. 25, 1971, Ser. No. 109,506
Claims priority, application Japan, Jan. 31, 1970, 45/9,873
Int. Cl. F01n *3/14*
U.S. Cl. 23—277 C 5 Claims



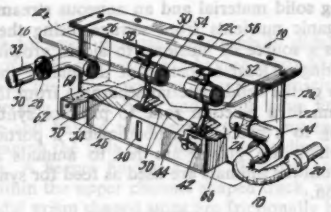
A rotary afterburner for internal combustion engines includes a rotary heat exchanger in the form of a honeycomb matrix located within a combustion chamber into which exhaust gases from the engine exhaust manifold are introduced after passing through one section of the rotating heat exchanger. The exhaust gases are burned in the combustion chamber and thence are passed through another section of the rotating heat exchanger and finally exhausted to atmosphere through an exhaust pipe.

3,698,874
DUST CONTROL APPARATUS FOR FLUIDIZED BED REACTORS
Frederick A. Zenz, Bryant Ave., Roslyn Harbor, N.Y. 11576
Filed July 23, 1970, Ser. No. 57,614
Int. Cl. B01d *45/12;* **B01j** *9/18;* **B04c** *5/30*
U.S. Cl. 23—284 **9 Claims**



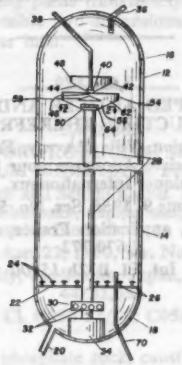
An improved system for reducing dust emission to the atmosphere from a fluidized bed reactor. The system employs cyclone separators one of which, in addition to returning separated particles to the bed through a dip-leg, is provided with means for bypassing a small part of the gas stream to a filtering system. The system reduces dust emission by subjecting part of the gas stream carrying non-separable particles as an underflow stream to a filtering operation while returning separated fines to the fluid bed.

3,698,875
DEVICE FOR CLEANING EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE
Susumu Yamada, 36–15, 1-chome, Amanuma, Tokyo, Japan
Filed May 13, 1970, Ser. No. 36,714
Int. Cl. B01d *39/00, 53/02*
U.S. Cl. 23—288 F **8 Claims**



A device for cleaning the exhaust gas from an internal combustion engine comprising a housing packed with powder or chips of metals, a reservoir in the housing containing a suitable emulsion which is vaporized by the heat of the exhaust gas, the contaminants such as carbon, lead, tar, etc. being trapped by the packed powder or chips and adhered thereto by the heat of the exhaust gas, cylindrical hollow bodies each having a filter having a catalytic action, the harmful gases contained in the exhaust gas being converted into harmless carbon dioxide by said filter and the vapor of the emulsion, and a storage containing therein activated carbon for removing the odour from the exhaust gas, whereby the exhaust gas is cleaned and discharged from the housing.

3,698,876
VAPOR LIQUID SEPARATION APPARATUS
Armand A. Gregoli, Somerville, and William R. Mounce, Cranbury, N.J., assignors to Cities Service Research & Development Company
Filed Dec. 17, 1970, Ser. No. 99,203
Int. Cl. B01d *50/00;* **B01j** *9/16;* **C10g** *23/00*
U.S. Cl. 23—288 E **5 Claims**



Apparatus for effecting improved vapor-liquid separation in an upflow refining vessel is shown. In combination with the upflow type vessel, the apparatus comprises a centrally mounted vertical recycle conduit having a funnel shaped downcomer, a liquid drawoff pipe having a widemouth downwardly directed inlet located above the downcomer, a drawoff pan having a cone shape bottom and sidewalls rising above the level of the drawoff pipe inlet mounted between the downcomer and the inlet, and a deflector mounted within the downcomer. A set of vertically mounted vanes is positioned within the downcomer section just above the recycle conduit joint.

ERRATUM

For Class 29—183 see:
Patent No. 3,698,863

3,698,877
SINTERED CHROMIUM STEEL AND PROCESS FOR THE PREPARATION THEREOF
Kenya Motoyoshi, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Dec. 15, 1969, Ser. No. 884,897
Claims priority, application Japan, Dec. 13, 1968, 43/91,872; Mar. 12, 1969, 44/19,150; Nov. 4, 1969, 44/88,631
Int. Cl. B22f *3/12*
U.S. Cl. 29—182 **16 Claims**

Sintered chromium steel of high density, high strength, and high heat resistance is obtained by mixing an intermetallic compound FeCr (in the so-called sigma phase), pulverized to less than 10 microns, with iron powder and carbon powder, and if desired with other alloy powders, and by molding and sintering the thus obtained mixture.

3,698,878
SINTERED TUNGSTEN CARBIDE-BASE ALLOYS
Thomas E. Hale, Warren, Mich., assignor to General Electric Company
No Drawing. Filed Dec. 29, 1969, Ser. No. 888,860
Int. Cl. B22f *3/24*
U.S. Cl. 29—182.7 **4 Claims**

Sintered tungsten carbide-base alloys containing from 40–80% by weight of an iron-base binder alloy which in

turn contains from about 5–25% by weight nickel and an amount of carbon ranging from about 0.5–2% by weight of the binder. The alloys of the invention are prepared by sintering a pressed mixture of the tungsten carbide and binder, which may then be machined or otherwise shaped in the soft as-sintered state and subsequently hardened by heat treatment to form a fully dense, strong and hard cemented carbide compact.

3,698,879

CHEVRON SHAPED ARTICLE AND A SANDWICH STRUCTURE THEREFROM

Victor Gewiss Lucien, Ville d'Avray, France, assignor to Marc Wood Societe Anonyme pour la Promotion des Echanges Techniques Internationaux, Paris, France

Filed June 9, 1955, Ser. No. 514,171

Claims priority, application France, June 10, 1954, 670,772

Int. Cl. B32b *15/00*

U.S. Cl. 29—191 **24 Claims**

1. A structural element comprising a sandwich of two cover sheets and an interposed core sheet integrally secured with the cover sheets, said core sheet being corrugated with the corrugations extending in zig-zag parallel rows and each corrugation having a crest ridge secured to one cover sheet and a valley ridge secured to the other cover sheet, said ridges terminating in a peaked edge so that the core sheet can be formed by folding from a flat sheet without stretching the material, and said corrugations having inclined planar side walls between the crest and valley ridges.

3,698,880

SOLDERABLE STAINLESS STEEL

Edwin Russell Koons, Whiteland, Ralph G. Parker, Jr., Shelbyville, and Jeffery P. Rupley, Lawrence, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Application Nov. 5, 1969, Ser. No. 871,344, now Patent No. 3,634,048, which is a division of application Ser. No. 705,372, Feb. 14, 1968, now Patent No. 3,515,950. Divided and this application Apr. 30, 1971, Ser. No. 139,205

Int. Cl. B32b *15/04*

U.S. Cl. 29—195 **5 Claims**

Means and method for rendering solderable a stainless steel body resistant to corrosive attack from common electrolytes. The method includes the steps of covering at least one surface of a stainless steel body with layers of metal including a first metal layer selected from the group consisting of nickel, cobalt and chromium which serves as a barrier layer to the diffusion of a subsequent metal layer or layers therethrough to the stainless steel body. The subsequent metal layer is resistant to corrosive attack from common electrolytes and is solderable. The subsequent metal layer consists of silver alloyed with a noble metal selected from the group consisting of gold, palladium, platinum, rhenium and osmium. The alloy layer may be formed by covering the barrier layer with a layer of silver and then a layer of gold or one of the other metals. The layered stainless steel body is heated to a temperature below the melting point temperature of the metal layer having the lowest melting point so that the layers, with the exception of the barrier layer, diffuse into one another, thereby forming the alloy layer overlying the barrier layer which is resistant to corrosive attack from common electrolytes and is solderable. The stainless steel body is rendered solderable.

ERRATUM

For Class 29—195 see:
Patent No. 3,698,932

3,698,881

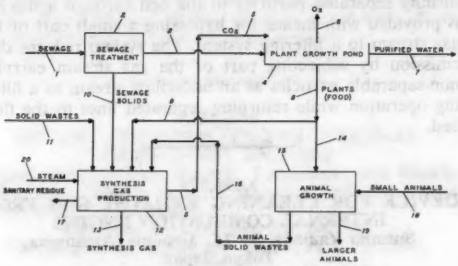
SYNTHESIS GAS PRODUCTION

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of applications Ser. No. 34,834, May 5, 1970, and Ser. No. 39,116, May 20, 1970. This application Aug. 5, 1970, Ser. No. 62,234

Int. Cl. A01h *13/00*; A23k *1/00*; C10j *3/00*

U.S. Cl. 48—209 **10 Claims**



A process for producing synthesis gas which comprises separating solid material and an aqueous stream containing inorganic nutrients from sewage, using the aqueous stream as a source of nutrients to aid in growing plants, and reacting at least a portion of the plants and at least a portion of the solid material separated from the sewage with steam in a reaction zone to produce synthesis gas. According to a preferred embodiment, a portion of the plants which are grown are fed to animals and solid wastes from the animals are used as feed for synthesis gas production.

3,698,882

CONTINUOUS PROCESS FOR THE CONVERSION OF CARBONACEOUS SOLIDS INTO PIPELINE GAS

Donald E. Garrett, Claremont, and Allan S. Sass, South Pasadena, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

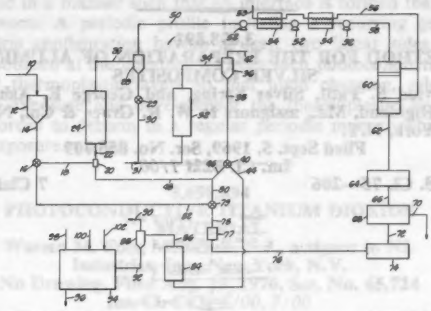
Filed Sept. 30, 1970, Ser. No. 76,700

Int. Cl. C10j *3/00, 3/46*

U.S. Cl. 48—210 **12 Claims**

Continuous process for converting particulate carbonaceous materials to pipeline gas by rapid pyrolysis and separation of the material into a volatilized hydrocarbon phase and a char solids phase followed by in-

flight compression, heating and contacting of the volatilized hydrocarbons with hydrogen to effectuate the



conversion, with the char being utilized as a raw materials source for the hydrogen.

3,698,883

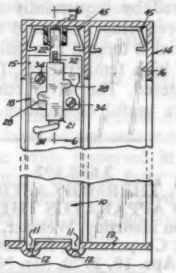
SLIDING PANEL LOCK

Joseph Di Fazio, Warren, Mich., assignor to Acorn Products Company, Detroit, Mich.

Filed Apr. 1, 1971, Ser. No. 130,179

Int. Cl. E05d *15/08*; E05f *5/06*; E05c *1/04*

U.S. Cl. 49—449 **10 Claims**



A lock for track mounted, horizontally slidable panels, formed of a one-piece housing having a box-like base, for securing to the panel, with an integral open channel slidably receiving a slide bolt, and a thin plate fitted within the base and having an integral, struck-out springy portion engaging the bolt for frictionally holding it in preset positions. A keeper having a bolt receiving socket is secured within the upper channel shaped track, and resilient trapezoidal prism shaped stops are frictionally held within the upper channel shaped track to prevent upward movement of the panel and thus removal of the panel from the track.

3,698,884

MULTIELEMENT CONDUCTIVE FACEPLATE

Robert E. Curran, Hawthorne, Glenn D. Robertson, Jr., Malibu, and Richard D. Ketchpel, Santa Barbara, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 9, 1970, Ser. No. 96,392

Int. Cl. C03b *29/00*; C03c *27/00, 29/00*

U.S. Cl. 65—43 **2 Claims**

A method of constructing a faceplate is described, which contains a multitude of closely spaced, discrete, conductive elements to permit passage of electrical signals from one side of the faceplate to the other. The faceplate is completely impermeable to gases. This method comprises placing a metal bar pattern on ribbon glass, cutting and stacking sheets of the glass, and subjecting the stack to heat and pressure. The method of construction permits the ready placement of a large number of closely spaced discrete conducting paths transversely through the faceplate making possible two-dimensional arrays of 500 or more elements per inch.

3,698,885

PROCESS FOR PRODUCING SLOW-ACTING POTASSIUM PHOSPHATE FERTILIZERS

Masao Hamamoto and Seiichi Kamo, Tokyo, and Kiyoshi Nakayama, Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited

Filed Apr. 22, 1970, Ser. No. 30,929

Claims priority, application Japan, Apr. 24, 1969, 44/31,651

Int. Cl. C05b *13/00*; C05d *9/02*

U.S. Cl. 71—1 **14 Claims**

A mixture of phosphate rock, caustic potash and phosphoric acid is calcined. The phosphate rock, caustic potash and phosphoric acid are preferably present in the molar proportion of 1.0:1.7–3.7:1.2–2.0 calculated as

$$P_2O_5:CaO:K_2O$$

respective. The mixture may also contain a boron-containing compound and/or a magnesium-containing compound.

3,698,886

1-(3 - TRIFLUOROMETHYLPHENYL) - 4,6-DIISOPROPYL - 3,5 - DIMETHYLHEXAHYDRO-1,3,5-TRIAZIN-2-ONE AS A HERBICIDE

John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 4, 1968, Ser. No. 734,217

The portion of the term of the patent subsequent to Aug. 25, 1987, has been disclaimed

Int. Cl. A01n *9/22*; C07d *55/50*

U.S. Cl. 71—93 **7 Claims**

1-(3-trifluoromethylphenyl)-4,6 - diisopropyl - 3,5 - dimethyl-hexahydro - 1,3,5 - triazin-2-one, the preparation thereof and the phytocidal use thereof.

3,698,887

UREAS AND PHYTOTOXICANTS

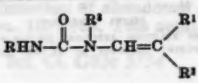
John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 737,265, Mar. 26, 1968, which is a division of application Ser. No. 523,884, Feb. 1, 1966, now Patent No. 3,399,231. This application Sept. 25, 1970, Ser. No. 75,755

Int. Cl. A01n *9/20*

U.S. Cl. 71—120 **18 Claims**

N-(1-alken-1-yl) ureas of the formula



wherein R^1, R^2 and R^3 are alkyl and R is aryl or substituted aryl, and phytotoxic use thereof.

3,698,888
METALLOTHERMIC PRODUCTION OF MAGNESIUM

Julian Miles Avery, 47 Old Orchard Road, Chestnut Hill, Mass. 02167

No Drawing. Continuation-in-part of application Ser. No. 796,214, Feb. 3, 1969, now Patent No. 3,658,509, dated Apr. 25, 1972, which is a continuation-in-part of application Ser. No. 648,856, June 26, 1967, now Patent No. 3,579,326, dated May 18, 1971. This application Apr. 6, 1970, Ser. No. 26,116
The portion of the term of the patent subsequent to Apr. 25, 1989, has been disclaimed
Int. Cl. C22b *45/00*
U.S. Cl. 75—67 11 Claims

Magnesium is produced by the metallothermic reduction of magnesium oxide in a reaction zone containing a molten slag of 0–25 percent alumina, 30–50 percent silica, 5–30 percent magnesium oxide, and the balance calcium oxide, by means of a metallic reducing agent containing 50–100 percent silicon, 0–40 percent aluminum and 0–15 percent iron, and in a reaction-condensation system containing in its vapor space inert gas at a partial pressure of 0.25–2 atmospheres.

3,698,889
NON-MAGNETISABLE STEEL

Karl Bungardt, Krefeld, Hermann Dietrich, Willich, and Gustav Lennartz and Hans-Egon Arntz, Krefeld, Germany, assignors to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

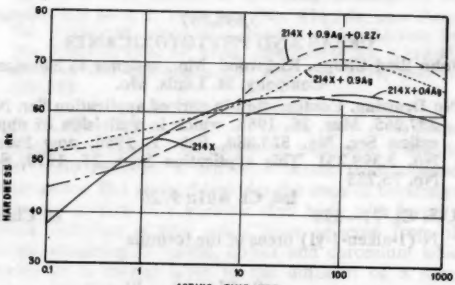
No Drawing. Filed May 24, 1971, Ser. No. 146,508
Claims priority, application Germany, June 5, 1970, P 20 27 676.0
Int. Cl. C22c *37/00, 39/54*
U.S. Cl. 75—123 7 Claims

A non-magnetisable steel which may be welded and which may be heat-treated to become resistant to intercrystalline corrosion and stress-corrosion and to have low-temperature toughness, is provided by an alloy steel containing manganese with small proportions of vanadium and possibly copper.

3,698,890
ALUMINUM ALLOY

Henry Dale Bewley, Paducah, Ky., assignor to the United States of America as represented by the United States Atomic Energy Commission

Continuation-in-part of application Ser. No. 63,457, Aug. 13, 1970. This application Dec. 9, 1971, Ser. No. 206,452
Int. Cl. C22c *21/02*
U.S. Cl. 75—147 4 Claims



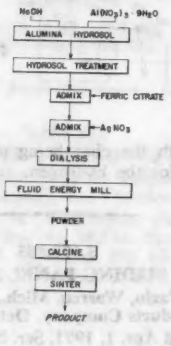
EFFECT OF ALLOYING ADDITIONS ON THE AGE-HARDENING RESPONSE OF AS CAST 214 X AT 350°F

A castable, age-hardenable, aluminum-base alloy consisting essentially of, in weight percent, 3.0–4.5 magnesium, 0.6–1.8 silicon, 0.4–1.5 silver zirconium at a concentration effective to impart increased fatigue strength to the resultant alloy, and the balance aluminum.

3,698,891
METHOD FOR THE PREPARATION OF ALUMINA SILVER COMPOSITES

Arvind S. Patil, Silver Spring, and George E. Ashby, Highland, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,709
Int. Cl. B22f *1/00*
U.S. Cl. 75—206 7 Claims



Alumina ceramics containing more than one percent silver are prepared by sequentially treating an alumina hydrosol with a reducing agent and a silver salt, or vice versa. The material is treated in a fluid energy mill which is operated at a high temperature. The material is then calcined and sintered. The silver containing alumina of this invention are useful as ablative compositions.

3,698,892
METHODS OF THERMOPLASTIC XEROGRAPHY AND APPARATUS THEREFOR

John Crampton Heurtley, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Apr. 10, 1970, Ser. No. 27,310
Int. Cl. B41m *5/20;* G03g *13/22*
U.S. Cl. 96—1.1 25 Claims

Methods of thermoplastic xerography and apparatus therefor are provided in accordance with the teachings of the present invention wherein an electric field applied during the development of a photoreceptor structure, which includes a thermoplastic layer, may be relied upon to tune the quasi resonant frequency exhibited by such thermoplastic layer to a desired value and/or to force the thermoplastic layer to deform in a regular periodic manner which is exposure related.

3,698,893
METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR

John C. Heurtley, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1970, Ser. No. 73,317
Int. Cl. G03g *13/22;* B41m *5/20*
U.S. Cl. 96—1.1 27 Claims

The present invention is directed to organized thermoplastic xerography techniques and more particularly to photoreceptor structure and methods of forming such photoreceptor structure so that viewable frost deformation patterns which are everywhere periodic may be formed on the surface of a thermoplastic layer using such organized thermoplastic xerography techniques. Accord-

ing to an embodiment of the present invention, photoreceptor structure which includes at least a photoconductive layer and an over-coated thermoplastic layer is provided in a manner such that an interface is formed therebetween. A periodic profile including a recurring geometric configuration having at least two linear sides is established at the interface between such photoconductive and thermoplastic layers so that upon charging, selective exposure and development the thermoplastic layer is forced to deform in a regular periodic manner which is exposure related.

3,698,894

PHOTOCONDUCTIVE TITANIUM DIOXIDE MATERIAL

Warren M. Foss, Metuchen, N.J., assignor to NL Industries, Inc., New York, N.Y.

No Drawing. Filed Aug. 20, 1970, Ser. No. 65,724
Int. Cl. C03g 5/00, 7/00
U.S. Cl. 96—1.5 4 Claims

A new type of photoconductive anatase titanium dioxide composition has been produced which comprises euhedral shaped titanium dioxide particles having an average individual crystal size from 0.2 to 5.0 microns, the surface of said crystals containing a dense coating of zinc oxide in amount from 1% to 4% and containing from 0% to 1% of a dense coating of lead oxide, the percentages based on the weight of the titanium dioxide.

3,698,895

PHOTOELECTROSTATIC MEMBERS

Ronald B. Schultz, Waukegan, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 618,352, Feb. 24, 1967. This application Sept. 22, 1970, Ser. No. 74,507
Int. Cl. G03g 5/00, 7/00
U.S. Cl. 96—1.8 9 Claims

A photoelectrostatic member (sheet materials such as paper) coated with a layer of a photoconductive insulating material such as zinc oxide dispersed in a special polyurethane resin produced from a fatty acid ester of a polyhydric alcohol, wherein the polyhydric alcohol portion of the ester contains at least two free hydroxyl radicals, and an organic polyisocyanate.

3,698,896

DIFFUSION TRANSFER FILM UNIT WITH IMPROVED DYE IMAGE RECEIVING LAYER COMPRISING A BASIC POLYMERIC MORDANT

Thomas I. Abbott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,486
Int. Cl. G03c 5/54, 5/48, 1/48
U.S. Cl. 96—3 22 Claims

A hydrophilic colloidal overcoat layer on a dye image-receiving element is useful for providing stable dye images of high quality in a color development diffusion transfer system utilizing immobile couplers which form diffusible dyes.

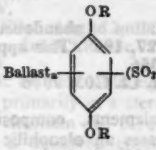
3,698,897

DIFFUSION TRANSFER PROCESSES AND FILM UNITS COMPRISING COMPOUNDS WHICH ARE CLEAVABLE UPON OXIDATION IN ALKALI MEDIA TO PRODUCE DIFFUSIBLE DYES OR DYE PRECURSORS

Thomas E. Gompf, Penfield, and Kin Kwong Lum, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 6, 1971, Ser. No. 160,068
Int. Cl. G03c 1/40, 5/54, 7/00
U.S. Cl. 96—3 21 Claims

Color, diffusion transfer photographic elements, film units and processes are described which employ dye image-providing materials which are cleavable upon oxidation in an alkaline medium to release a dye or dye precursor which diffuses to a dye image-receiving layer. The compounds have the formula:



wherein R is H or a hydrolyzable entity, *n* is 1 to 3 and *m* is 1 to 3.

3,698,898

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING A COMPOUND WHICH IN THE PRESENCE OF ALKALI RELEASES A DIFFUSIBLE PHOTOGRAPHIC REAGENT

J. Michael Grasshoff, Hudson, and Lloyd D. Taylor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Dec. 17, 1970, Ser. No. 99,310
Int. Cl. G03c 5/54, 5/48, 1/34
U.S. Cl. 96—3 31 Claims

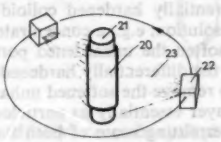
Novel compounds which release a photographic reagent in the presence of alkali, which compounds may be defined as quinone- or naphthoquinone-methide precursors containing the photographic reagent moiety; and photographic products and processes employing the same.

3,698,899

METHOD OF MANUFACTURE OF PRINTED ARTICLES, IN PARTICULAR PRINTED KNITTED ARTICLES

Bernard Giberstein, Paris, France, assignor to Begy Societe Europeenne de Bas sans Couture, Autun (Saone-et-Loire), France

Filed Aug. 17, 1970, Ser. No. 64,428
Claims priority, application France, Aug. 27, 1969, 6929321; June 10, 1970, 7021298
Int. Cl. G03c 5/04
U.S. Cl. 96—27 5 Claims



A method of manufacture of printed knitted articles, hosiery, stockings, tights and the like wherein, in order to carry out the desired printing, the article is provided with a light sensitive substance at a given moment during its treatment, it is fitted on a form and subsequently subjected to photographic exposure which acts upon the said substance, and the said exposed substance is thereafter developed and fixed on the said article.

3,698,900

DIFFUSION TRANSFER PROCESS UTILIZING 2-MERCAPTO IMIDAZOLES

Edward J. Johnson, Jr., Tewksbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Continuation of abandoned application Ser. No. 698,719, Jan. 18, 1968. This application Aug. 23, 1971, Ser. No. 174,123
Int. Cl. G03c 5/54
U.S. Cl. 96—29 4 Claims

2-mercapto imidazoles are utilized in diffusion transfer processes to give positive transfer prints of improved quality over a broad range of processing temperatures.

3,698,901
PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

Herbert S. Elins and James P. Van Meter, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 787,616, Dec. 27, 1968. This application June 25, 1971, Ser. No. 157,056
Int. Cl. G03f 7/06
U.S. Cl. 96—33 26 Claims

In photographic elements, compositions, especially emulsions, and processes an oleophilic complex of (a) a photographic addendum, especially a silver halide developing agent, with (b) an organic, Group V element oxide, which complex has the property of releasing the photographic addendum in the presence of an alkali provides reduced desensitization, improved latent image stability and improved photographic addendum release upon contact with alkali. Photographic elements, such as lithographic plates, containing an oleophilic complex of (a) a silver halide developing agent containing at least one hydroxyl group with (b) an organic phosphine oxide and/or an organic amine oxide are especially suitable. A wide range of photographic addenda can be employed, including, for instance, developing agents, filter dyes containing hydroxyl groups, couplers containing hydroxyl groups and the like. It is believed the moieties of the described complex are hydrogen bonded together.

3,698,902
METHOD OF PRODUCING COLLOID RELIEF IMAGES

Bela Gaspar, 240 S. Oakhurst Drive, Beverly Hills, Calif. 90212

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,702
Int. Cl. G03c 5/00
U.S. Cl. 96—35 13 Claims

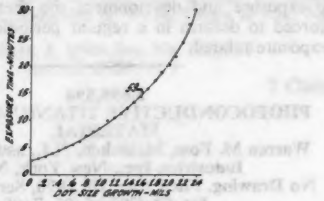
In a process for producing a colloid relief image by exposing a light sensitive colloid layer to the action of light to produce a differentially hardened colloid layer containing hardened portions which have been exposed to light and unhardened portions, the improvement which comprises removing the unhardened portions by contacting the differentially hardened colloid layer with a hot aqueous salt solution, e.g., a concentrated sodium chloride solution, to soften the unhardened portions, followed by treatment of the differentially hardened colloid layer with cold water to remove the softened unhardened portions of the colloid layer essentially as particles suspended in the water, and permitting reuse of both the hot salt solution and the cold water, following removal of the suspended particles, for further processing to provide colloid relief images as above described.

3,698,903
METHOD OF MAKING A GRADED PHOTO-PRINTING MASTER

John A. Dodd, Jr., Haddonfield, and Robert A. Geshner, Cherry Hill, N.J., assignors to RCA Corporation

Filed Jan. 24, 1969, Ser. No. 793,665
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 4 Claims

A graded dot photo-printing master is made by providing a first master comprising a multiplicity of spaced opaque dots of uniform size located in a desired pattern or array on a clear background; contact printing the first master to produce a second master comprising negative replica thereof having spaced clear areas of the same size as the dots on an opaque background; and contact printing the second master through a rotating shutter having a specially-shaped aperture for varying the time of exposure from a maximum at the center to a minimum at the outer edge, to produce a third master having spaced clear or opaque areas of graded size on an opaque or clear background, depending on the type of photographic emulsion used. When a positive type emulsion is used, to produce a third master with graded clear areas on an opaque background, that stencil is subsequently contact printed with a negative-type emulsion to produce the final graded dot master with spaced opaque dots varying in size from a maximum at the center to a minimum at the outer edge. This final master is used, with another master having a similar pattern of uniform larger-size opaque dots, to form the holes in a graded mask for a color picture tube.



3,698,904
COMPOSITION FOR DEVELOPING PHOTOPOLYMERIZABLE LITHOGRAPHIC PLATE ELEMENTS COMPRISING A DEVELOPER BASE AGENT, AN INK-RECEPTIVITY-AFFORDING AGENT AND A DESENSITIZER

Hisaaki Fukui and Taketoshi Araki, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed July 6, 1970, Ser. No. 52,728
Claims priority, application Japan, July 23, 1969, 44/57,671
Int. Cl. G03c 5/24
U.S. Cl. 96—48 28 Claims

Developer composition for a lithographic plate which is to be used for the photopolymerized layer obtained by exposing to actinic light a selected area of a coating of a photopolymerizable layer from a specified photosensitizing solution consisting of (I) a photopolymerizable component comprising an unsaturated polyester, at least one ethylenically unsaturated monomer, a photopolymerization initiator and a thermal polymerization inhibitor and (II) at least one solvent. Said developer composition consists of at least one developer base agent, at least one ink-receptivity affording agent, at least one desensitizer and, if necessary, at least one etching agent and enables to attain effects of ink-receptivity, densensitization and etching simultaneously with development by one time application of one solution.

3,698,905
DECORATING ANODIZED METAL WITH DYE IMBIBITION TRANSFERRED IMAGES

Warren Guy Van Dorn and James Maurice Hardenbrook, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,354
Int. Cl. G03c 5/00, 7/00; G03f 3/04
U.S. Cl. 96—48 R 11 Claims

Decorating anodized metals, such as aluminum, by exposing said anodized metal substrate bearing a light-sensitive layer to actinic radiation to establish a potential R_d of 0.2 to 2.2, applying a dry powder comprising a water soluble dye to the light-sensitive layer, embedding the developing powder in image-wise configuration into the light-sensitive layer, removing the developing powder from the non-image areas and molecularly imbibing and

transporting said dye from the dry powder into the pores of the anodized metal in image-wise configuration by contacting said light-sensitive layer with water vapor.

3,698,906
PHOTOGRAPHIC MULTI-TONE SEPARATION PROCESS
Michael J. Kelly, Brookmont, Md.
(6307 MacArthur Blvd., Apt. 1B, Bethesda, Md. 20016)
Filed June 26, 1970, Ser. No. 50,243
Int. Cl. G03c *5/06*
U.S. Cl. 96—44 40 Claims

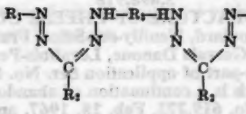
A process for the separation of tonal bands from an original transparency having multiple tonal bands. The process includes a phase which makes a series of masks of the original tonal bands by controlled exposure through the original transparency and a phase in which a new photosensitive material is exposed through the masks and screens, or, alternatively, using the masks with light-sensitive color dyes. A final product is obtained in which the areas corresponding to the original tonal bands have a changed pictorial representation and these areas are represented by screen patterns, or, alternatively, colored bands. A specific example of the process starts with altitude charts having three tonal bands produced by the Universal Automatic Map Compilation Equipment (UNAMACE). By means of controlled exposure of the original altitude chart, a series of masks of the altitude bands are produced and the masks are then used in making a final product in which the areas corresponding to the original tonal bands are represented as screen patterns or, alternatively, as colored bands.

3,698,907
LIGHT-SENSITIVE SILVER HALIDE COLOR-PHOTOGRAPHIC MATERIAL
Shui Sato, Tokyo, Sadao Sugita, Hanno, and Tomio Nakajima and Keiji Kasai, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed Dec. 23, 1970, Ser. No. 101,141
Claims priority, application Japan, Dec. 29, 1969, 45/105,148
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 R 5 Claims

An ultraviolet absorber of the hydroxybenzotriazole type is stably incorporated into a light-sensitive silver halide color-photographic material so as to improve the resulting colored dye image in light fastness.

3,698,908
PHOTOGRAPHIC MATERIALS COMPRISING FORMAZAN DYES
Eric Macdonald, Llanbrynmair, Wales, and Frederick Campbell, Failsworth, England, assignors to Ilford Limited, Ilford, Essex, England
No Drawing. Filed Feb. 19, 1971, Ser. No. 117,123
Claims priority, application Great Britain, Feb. 19, 1970, 8,095/70
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 R 2 Claims

The application describes a formazan dye of the formula:



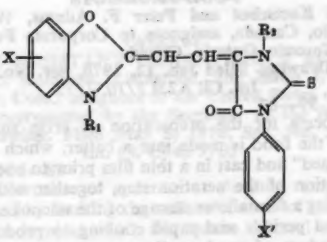
wherein R_1 is an aryl or substituted aryl group, R_2 is an alkyl group containing up to 6 carbon atoms and R_3 is either a diphenyl or a stilbene linkage group wherein, in either group, each of the benzene nuclei is substituted with a sulphonic acid group or an alkali metal or ammonium salt thereof.

3,698,909
PHOTOGRAPHIC DYE IMAGE STABILIZER-SOLVENT
Gregory James Lestina and Max Herman Stern, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Aug. 12, 1970, Ser. No. 63,270
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 24 Claims

A photographic element utilizing a color coupler compound dissolved primarily in a sterically hindered phenol exemplified by a chroman - 6 - ol; a silver halide emulsion containing such a dissolved coupler compound and a method for utilizing the element or emulsion to obtain durable products having reduced bulk and good image stability to light.

3,698,910
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL
Kaiichiro Sakazume, Shigemasa Ito, and Shui Sato, Tokyo, Eiichi Sakamoto, Hanno, and Akio Oshima, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed June 23, 1970, Ser. No. 49,182
Claims priority, application Japan, June 23, 1969, 44/48,893
Int. Cl. G03c *1/08*
U.S. Cl. 96—122 1 Claim

New dimethine merocyanine dyes containing, in addition to a thiohydantoin nucleus, two water-solubilizing groups in a single molecule was found particularly effective for sensitization of a green-light sensitive silver photographic emulsion. The dyes can be represented by the general formula



(I)

wherein R_1 is a sulfoalkyl or carboxyalkyl group which may be in salt form; R_2 is a carboxylalkyl group; X is a hydrogen or halogen atom or an alkyl or alkoxy group; and X′ is a hydrogen or chlorine atom.

ERRATUM

For Class 96—91 see:
Patent No. 3,699,000

3,698,911
PROCESS FOR THE PRODUCTION OF DRY MOLASSES FROM SUGAR-CANE OR BEET-ROOT MOLASSES
Armando Paulo Pellegrini, 1329 Rue Ouro Preto, Belo Horizonte, Brazil
No Drawing. Filed Dec. 9, 1970, Ser. No. 96,572
Int. Cl. A23k *1/02*
U.S. Cl. 99—6 10 Claims

A process for producing dry solid molasses comprising adjusting the pH of liquid molasses to about 8–10.5 at temperatures of about 60–70° C. and drying the mixture.

3,698,912
PROCESS FOR MAKING NUTRIENT COMPOSITION
Milton Winitz, Palo Alto, Calif., assignor to Morton-Norwich Products, Inc., Chicago, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 705,299, Feb. 14, 1968. This application July 1, 1969, Ser. No. 838,338
Int. Cl. A23l *1/42*
U.S. Cl. 99—14 23 Claims

A process for making palatable nutrient compositions for human consumption which contain all of the essential amino acids plus non-essential amino acids in nutritionally balanced relationship. Aqueous solutions of acid- or enzyme-hydrolyzed proteins provide a starting point for the process.

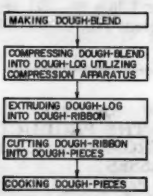
3,698,913
TREATMENT OF DISTILLED ALCOHOLIC LIQUORS
Theodore Malinin, Alexandria, Va.
(360 Atlantic Road, Key Biscayne, Fla. 33149)
No Drawing. Filed Sept. 11, 1970, Ser. No. 71,393
Int. Cl. C12f *1/00*; C12g *3/12*
U.S. Cl. 99—34 5 Claims

A method for improving and mellowing the taste of alcoholic distilled liquors and for bringing about a shift in the pH value toward the neutral range, by reducing the total ester content and total fusel oil content, involves intimately contacting the liquor with a gaseous mixture of oxygen and carbon dioxide in which the percent of carbon dioxide by volume is in the range from about 5% to about 15%.

3,698,914
METHOD OF PREPARING TEXTURED SNACK FOOD PRODUCTS
Cornelis Kortschot and Peter F. Adams, Willowdale, Ontario, Canada, assignors to Corporate Foods Limited, Toronto, Ontario, Canada
No Drawing. Filed Jan. 12, 1970, Ser. No. 2,407
Int. Cl. A23l *1/10, 1/12*
U.S. Cl. 99—83 5 Claims

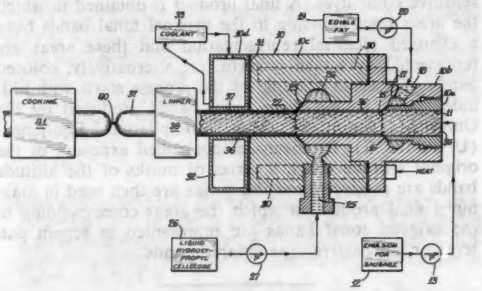
A process for the preparation of crisp snack foods wherein the food is made into a batter, which is aerated or "foamed" and cast in a thin film prior to cooking. The combination of the aeration step, together with the step of forming a film allows storage of the uncooked food for prolonged periods and rapid cooking to produce a uniform product of good quality.

3,698,915
METHOD FOR MAKING POTATO CHIP-TYPE FOOD PRODUCT
Colin F. Glasgow, Billings, Mont., assignor to Pate Foods, Inc., South Beloit, Ill.
Filed Aug. 19, 1970, Ser. No. 64,973
Int. Cl. A23l *1/12*
U.S. Cl. 99—100 P 3 Claims



This invention relates to a method for producing a chip-type fried food product containing as a major portion thereof potato flakes which are in particulate form distributed throughout a farinaceous flour matrix. The method comprises the following steps in order: making a non-gelatinous crumbly dough-blend; loading a batch of said dough-blend into a novel dough compression apparatus for controllably compressing and de-aerating same into a non-gelatinous relatively abrasive-resistant dough-log; extruding the dough-log into an elongate dough-ribbon; cutting the dough-ribbon into relatively short dough-pieces; and cooking the non-gelatinous dough-pieces under controlled conditions to produce a non-puffy relatively compact chip-type food product.

3,698,916
CONTINUOUS SAUSAGE MANUFACTURE
Stephen T. Moreland, 789 Anita Ave., Grosse Pointe Woods, Mich. 48236
Filed June 17, 1970, Ser. No. 46,975
Int. Cl. A22c *11/00*
U.S. Cl. 99—109 5 Claims



A sausage emulsion is pumped through a passageway. At a first location along the passageway a water barrier material is introduced about the periphery of the emulsion. At a point downstream from that location a heat liquified casing forming material is introduced about the water barrier and solidified by cooling. Thereafter, the filled casing is handled conventionally.

3,698,917
FREE FLOWING POWDER CONTAINING CONFECTIONERS' SUGAR
Wilhelm Baum and Michael Gierlichs, Dusseldorf, Germany, assignors to Henkel & Cie., GmbH, Dusseldorf, Germany
No Drawing. Continuation-in-part of application Ser. No. 587,402, Oct. 18, 1966. This application Sept. 30, 1969, Ser. No. 862,528
The portion of the term of the patent subsequent to Dec. 29, 1987, has been disclaimed
Int. Cl. A23l *1/00*
U.S. Cl. 99—141 9 Claims

Free-flowing powder containing powdered sugar which will not cake upon storage and a continuous process for the preparation of the said powder.

3,698,918
MANUFACTURE OF CHEESE CURD
Marie Pierre Goujard, Neuilly-sur-Seine, France, assignor to Compagnie Gervais Danone, Levallois-Perret, France
Continuation-in-part of application Ser. No. 86,616, Nov. 3, 1970, which is a continuation of abandoned application Ser. No. 619,272, Feb. 28, 1967, and a continuation-in-part of abandoned application Ser. No. 803,432, Feb. 28, 1969. This application Feb. 26, 1971, Ser. No. 119,338
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 9 Claims

The present invention relates to a proces for the manufacture of milk curd by mixing previously acidified lactic

whey with concentrated milk, the acidity of the whey being between 0.5 and 2.5 and the pH of said mixture being between about 3 to about 5, the proportions of dry extract of said milk and the conditions of separation of said curd are so selected as to recover substantially as much of the whey as was used to produce curdling of the milk.

3,698,919

PREPARATION OF PLASTIC SUBSTRATES FOR ELECTROLESS PLATING AND SOLUTIONS THEREFOR

John J. Kuzmik, Torrington, Conn., assignor to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,249
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 5 Claims

Plastic substrates, such as ABS, are prepared for electroless metal plating by treatment of the surface at a temperature of about 100° to about 175° F. with an activating solution prepared by admixing a glycol ether and an acid stannous chloride-palladium hydrosol. In the hydrosol, catalyst metal particles of colloidal or semicolloidal nature are present. A complete plating process utilizing the glycol ether activating solution is also set forth.

3,698,920

POROUS CERAMIC INSULATING MATERIAL AND METHOD OF MAKING EMPLOYING WAX

John J. Pitha, Lenox, Mass., assignor to General Electric Company

Filed Aug. 30, 1967, Ser. No. 664,452
Int. Cl. C04b *33/00*
U.S. Cl. 106—41 16 Claims

Porous insulating material suitable for forming arching gap plates of lightning arresters is made from a mixture of aluminum oxide grains of selected particle size to provide increased porosity, molten wax and powdered glass, the warm mixture being cooled at a controlled rate to produce a homogeneous mass of free-flowing particles which are thereafter pressed into desired shape and fired at elevated temperature.

3,698,921

GLASS HAVING A HIGH COEFFICIENT OF ABSORPTION FOR INFRARED RADIATION COMPRISING FERROUS OXIDE

Coenraad Maria La Grouw and Ong Tjing Gie, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Sept. 10, 1969, Ser. No. 856,824
Claims priority, application Netherlands, Sept. 14, 1968, 6813196; May 5, 1969, 6907225
Int. Cl. C03c *3/04*
U.S. Cl. 106—54 1 Claim

Glass having a high coefficient of absorption for infrared radiation which is suitable as an envelope for electronic components which are sealed by irradiation and the composition of which is situated within the following limits in percent by weight:

SiO_2	60–70
B_2O_3	0–2
Li_2O	0.5–2
Na_2O	10–16
K_2O	0–2
BaO	6–16
Al_2O_3	1–4
CaO+MgO	0–5
FeO	2–4

3,698,922

DOLOMITIC REFRACTORY

Ronald Staut, Cherry Hill, N.J., and George G. Judd, Woodville, Ohio, assignors to General Refractories Company, Philadelphia, Pa.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,040
Int. Cl. C04b *35/06*
U.S. Cl. 106—58 18 Claims

A dolomitic refractory which is produced by calcining dolomite to produce quicklime; slaking the quicklime under atmospheric pressure with at least 80 percent by weight of water until the quicklime comprises by weight on an oxide basis about 3 to 40 percent magnesium oxide; forming the slaked quicklime into a suitable refractory shape; and then sintering the shaped material to produce a refractory.

3,698,923

ALUMINA SUBSTRATES

Harold Wilbur Stetson, Newtown, Pa., and Warren Joseph Gyurk, Pluckemin, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of application Ser. No. 634,370, Apr. 27, 1967. This application May 6, 1970, Ser. No. 37,373
Int. Cl. C04b *35/10*
U.S. Cl. 106—62 5 Claims

High-alumina bodies have been produced which, in the as-fired condition, are flat, absorb no water, and have surface finishes of less than 3½ micro-inches on both sides. The method for their preparation includes steps for preparing the alumina, milling the alumina, preparing a casting slip, casting, drying and firing. Alumina bodies with such smooth surfaces are particularly useful as substrates for thin film circuits, devices, and integrated circuits.

3,698,924

SALINE RESISTANT CEMENTITIOUS BINDERS

George L. Kalousek, Lakewood, and Elton J. Benton, Denver, Colo., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed May 5, 1970, Ser. No. 34,862
Int. Cl. C04b *7/02*
U.S. Cl. 106—89 4 Claims

Saline corrosion of concrete at elevated temperatures is prevented by limiting the sulfate content of the cement binder to a level at which the apatite mineral ellestadite will not form.

3,698,925

APPLICATION OF COPOLYMERS OF POLYVINYL ACETALS AS A MEANS FOR PROTECTION, PRESERVATION, RESTORATION, STABILIZATION, HYDROPHOBIZATION OF PAPYRUS, PAPERS, BOOKS AND/OR MANUSCRIPTS

Karl Salz and Ladislav Skrivanek, Prague, Czechoslovakia, assignors to World Patent Development Corp.

No Drawing. Filed July 8, 1969, Ser. No. 840,048
Claims priority, application Czechoslovakia, July 12, 1968, 5,131/68
Int. Cl. B23p *7/00*; B32b *35/00*
U.S. Cl. 117—2 R 18 Claims

This invention is directed to restoration and preservation of cultural items on papyrus and/or paper (whether new or old) by impregnating same with a solvent solution of copolymers of polyvinyl acetals; or by laminating a free film of such copolymers to either or both faces of the document to be treated, with or without an interposed sheet of fine inert textile as a reinforcement; or by impregnating such document with the copolymers, then splitting the document down its median plane and then inserting a copolymer impregnated textile sheet between the split halves and reuniting the split halves. Once treated, such cultural items retain their papyrus-like and/

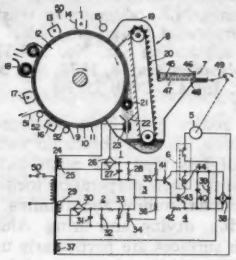
or paper-like qualities; yet, these cultural items have enhanced strength and color stability, are impervious to soiling, are resistant to aging, wear and mould formation and are waterproof.

3,698,926

METHOD AND APPARATUS FOR SUPPLEMENTING TONER IN ELECTROPHOTOGRAPHIC MACHINES

Masayoshi Furuichi, Tokyo, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 10, 1970, Ser. No. 88,378
Claims priority, application Japan, Nov. 11, 1969, 44/90,612
Int. Cl. G03g *13/00*
U.S. Cl. 117—17.5 3 Claims



A developing agent consisting of a magnetic carrier and a non-magnetic toner is utilized for developing latent images formed by an electrophotographic machine. The percentage content of the toner in the developing agent is detected by an inductance element for supplementing the toner whereby to maintain at a constant level the percentage content of the toner contained in the developing agent.

3,698,927

FOAM STRUCTURE WITH PROTECTIVE OVERCOAT

John M. Sawyer, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,869
Int. Cl. B32b *27/40*
U.S. Cl. 117—33.3 7 Claims

A composite structure comprising a foam substrate having an adherent overcoat wherein the overcoat is an essentially non-cellular cured polyurethane epoxy-containing composition, substantially opaque to ultraviolet light. The invention has particular utility for the preparation of building structures, such as roofs of buildings, which are exposed to ultraviolet light from sunlight and particularly to the destructive coaction of moisture and ultraviolet light.

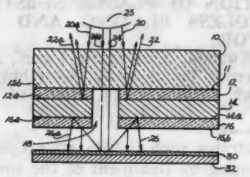
3,698,928

MULTILAYER ANTIREFLECTIVE ABSORPTION FILM

Eugene R. Blome, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Filed Nov. 14, 1967, Ser. No. 682,842
Int. Cl. G02b *1/10*
U.S. Cl. 117—45 1 Claim

A multilayer antireflective absorption mask comprising a transparent substrate having a first layer of oxidized chromium with the thickness adapted to selectively absorb reflected radiation that would be sensed by the eye (e.g., 5000 to 6000 angstroms); a layer of chromium masking material having a thickness adapted to absorb radiation that would expose a photoresist (e.g., 3000 to 6000 angstroms) and a second layer of oxidized chromium having a thickness adapted to selectively absorb reflected radiation that would exposed a photoresist (e.g., 3500 to 4500 angstroms). The light otherwise reflected and



transmitted through the substrate is selectively absorbed by the first layer of oxidized chromium and the non-reflected transmitted light is absorbed by the layer interposed between the two oxidized chromium layers. Light that reaches a reflector, via transparent areas of the multilayered mask (such as a semiconductor device with a photo-resist thereon) that is reflected thereby, is selectively absorbed by the second oxidized chromium layer.

3,698,929

METALLIZING EXPANDED PLASTICS ARTICLES

Adolf Diebold, Ludwigshafen, and Matthias Marx, Bad Duerkheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed June 18, 1969, Ser. No. 834,552
Claims priority, application Germany, June 22, 1968, P 17 71 661.9
Int. Cl. B44d *1/14*
U.S. Cl. 117—71 9 Claims

A method of metallizing the surface of expanded plastics articles by applying a layer of a coating composition containing finely dispersed iron particles and electroless deposition of copper by treating the said layer with an acid aqueous copper salt solution, a layer of an aqueous solution or dispersion of an organic polymer containing heteroatoms being applied and dried prior to application of the iron-containing coating.

3,698,930

PROCESS FOR THE PREPARATION OF IRIDESCENT FILMS AND FILAMENTS AND THE PRODUCT SO PRODUCED

Yves Fleurquin, Oullins, and Andre Bruckmann, Tassin la Demi Lune, France, assignors to La Cellophane, Paris, France

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,802
Claims priority, application France, Dec. 28, 1967, 134,042
Int. Cl. B44f *1/14;* B44d *1/16*
U.S. Cl. 117—45 11 Claims

A process for making iridescent films and filaments which comprises depositing on a flexible support a thin metallic layer, coating the metallized face thereof with a transparent varnish which adheres strongly thereto, drying said varnish, and depositing on the varnished face an extremely thin second metallic layer so that said second metallic layer is almost transparent to normally incident light rays while it reflects light inclined at a large angle and the products produced by said process.

3,698,931

METHOD OF GRAFTING POLYMERIZABLE MONOMERS ONTO SUBSTRATES

Carl Horowitz, Brooklyn, N.Y., assignor to Polymer Research Corp. of America, Brooklyn, N.Y.

No Drawing. Filed June 18, 1969, Ser. No. 834,489
Int. Cl. B44d *1/12*; C03c *17/00*; C08f *1/34*, *29/50*; D06d *1/00*
U.S. Cl. 117—47 R 2 Claims

A substrate is contacted with a grafting solution containing a silver salt, a polymerizable monomer and a catalyst which is adapted to activate the monomer to polymerization by itself being activated by metallic silver. The silver ion is reduced by the substrate and forms an insoluble metallic silver deposit on the substrate. The metallic silver activates the catalyst which in turn activates the polymerization reaction so that polymerization takes place and the formed polymer is grafted onto the substrate.

3,698,932

ARTICLES HAVING A LOW FRICTION SURFACE AND PROCESS OF MAKING SAME

Sheldon W. Dean, Hamden, Conn., assignor to Olin Corporation

Filed Jan. 25, 1971, Ser. No. 109,197
Int. Cl. B23p *3/00*; B44d *1/14*
U.S. Cl. 29—195 R 12 Claims

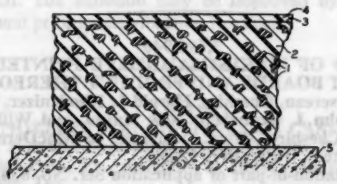
A substrate or article having a low friction surface and the process of making the same. The article consists of a metal base selected from aluminum, titanium, zirconium, tungsten, niobium, magnesium, nickel and their alloys and stainless steels. The metal base has a surface on which is formed a three layer low friction coating. The first layer adjacent the metal base comprises a metal selected from zinc, cadmium, bismuth, tin, antimony, lead, iron, copper and copper alloys. The second layer formed over the first layer comprises a metal soap or salt of the first layer and the third layer formed over the second layer comprises a fatty acid. Generally, the second layer is formed by reacting in part the first and third layers. The low friction surface provides articles such as fasteners, lamp bases, deep drawing blanks, etc. which are able to convert a greater degree of applied torque to working force than low friction surfaces comprising a metal soap or fatty acid alone.

3,698,933

COATED RESILIENT MATTING AND METHOD FOR MAKING

Robert Ernest Leeks, Reading, and Alfred John Demers, Peabody, Mass., assignors to The Borden Company, New York, N.Y.

Original application Nov. 25, 1966, Ser. No. 597,059, now Patent No. 3,562,193, dated Feb. 9, 1971. Divided and this application Mar. 31, 1970, Ser. No. 30,617
Int. Cl. B44d *1/14*; C08d *9/04*
U.S. Cl. 117—72 4 Claims



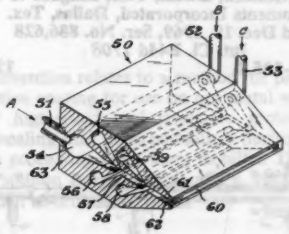
This invention relates to the method and composition produced by the steps of admixing a liquid binder of a polymer latex, elastomeric when cured, and an emulsified highly aromatic oil which is compatible with said polymer latex, combining with said binder, cured elastomeric aggregates having an average particle size less than about one inch in its greatest dimension and a curing agent for said polymer latex, applying the liquid binder and aggregates onto a surface, curing the coating, then coating the surface with a sealer being a polymer latex which is elastomeric when cured. The final cured composite is used as a covering layer on a resilent running track used in sporting events.

3,698,934

METHOD FOR MAKING HIGH BARRIER COATED PAPERS

Jacob Eichhorn and Stanley F. Roth, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original application Jan. 17, 1968, Ser. No. 698,613, now Patent No. 3,560,227, dated Feb. 2, 1971. Divided and this application Sept. 1, 1970, Ser. No. 68,773
Int. Cl. B32b *27/08*, *27/10*
U.S. Cl. 117—76 P 8 Claims



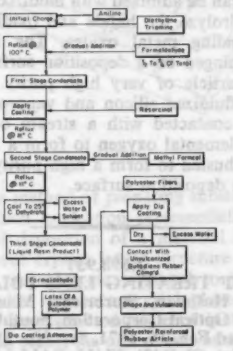
A new and useful high barrier film is described along with a method for its preparation. A layered polyolefin-halohydrocarbon melt is directly extruded onto a pretreated paper substrate to obtain a novel high barrier coated paper.

3,698,935

REINFORCING ELEMENTS FOR RUBBER

Peter A. Yurcick, South River, and Charles Tyler Bills, Metuchen, N.J., assignors to Ashland Oil, Inc., Houston, Tex.

Original application Sept. 8, 1967, Ser. No. 666,243. Divided and this application Feb. 3, 1971, Ser. No. 112,217
Int. Cl. B32b *27/36*; C09d *3/56*
U.S. Cl. 117—76 T 6 Claims



Fiber reinforcement is coated with an aqueous mixture of rubber latex, two-stage liquid polyhydric phenol aldehyde aromatic amine resin and sufficient additional reac-

tive aldehyde to render the resin thermosetting upon reaction therewith. The resin, which is prepared prior to admixture with the latex, is preferably formed by a stepwise reaction of aniline with formaldehyde, then resorcinol, and thereafter additional formaldehyde, the last-mentioned addition of formaldehyde being in the form of an alcoholic solution. The coated fiber reinforcement is dried and then, while in contact with an unvulcanized solid rubber matrix containing curatives, is subjected to sufficient heat and pressure to vulcanize and form the rubber into a reinforced article displaying improved adhesion between the rubber and reinforcement under conditions of high temperature and dynamic stress. Particularly worthwhile results have been observed in the bonding of polyester fibers to rubber, especially in pneumatic tires reinforced with polyester cords.

3,698,936

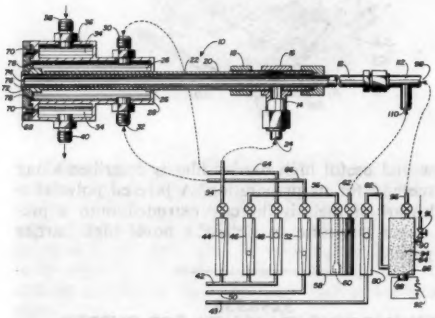
PRODUCTION OF VERY HIGH PURITY METAL OXIDE ARTICLES

Herbert J. Moltzan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1969, Ser. No. 886,628

Int. Cl. B44d *1/08*

U.S. Cl. 117—105.2 **12 Claims**



Very high purity metal oxide articles are produced by a process wherein a finely divided elemental metal is fluidized in a carrier gas and is intimately contacted with a vaporous combustible stream to form a reactant stream which in turn is ignited to form the metal oxide by direct oxidation of the fluidized metal compound. Vaporous metal halide can be admixed with fluidized metal to simultaneously hydrolyze the halide and oxidize the metal to the corresponding metal oxides. The ignited reactant stream is impinged on a deposition surface to form the metal oxide article of very high purity. In a preferred embodiment fluidized silicon and vaporous silicon tetra chloride are contacted with a stream of elemental hydrogen and elemental oxygen to form a resultant stream which is combusted to form a high purity silicon dioxide article on the deposition surface.

3,698,937

METHOD OF TREATING LENS POLISHING PADS

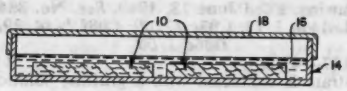
Donald O. Hoffman, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 16, 1971, Ser. No. 115,620

Int. Cl. B32b *27/12*; B44d *1/098*

U.S. Cl. 117—113 **5 Claims**

Pads of felt used for polishing lenses and the like are impregnated with an elastomeric fiber bonding material by immersion in a solution of a polyurethane in a chemical solvent to which is added a gelling ingredient to promote homogeneous impregnation of the felt by the polyurethane. Controlled periods of immersion followed



by drying and curing cycles which respectively remove solvents and cure the polyurethane in situ complete the process.

3,698,938

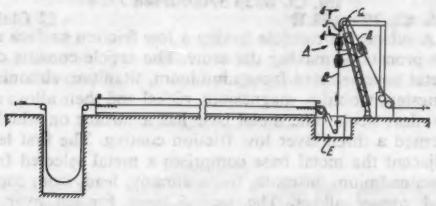
METHOD OF COOLING HOT DIPPED GALVANIZED, CONTINUOUSLY MOVING WORKPIECES

John T. Mayhew, Box 156, Sunset Drive, Toronto, Ohio 43964

Original application Mar. 19, 1970, Ser. No. 20,945, now Patent No. 3,611,530. Divided and this application July 27, 1971, Ser. No. 166,342

Int. Cl. C23c *1/02*

U.S. Cl. 117—114 A **4 Claims**



A process of cooling a hot dipped galvanized, continuously moving workpiece by passing the galvanized workpiece over an idler roll having a ferric oxide coating on its outer surface and directing a cooling fluid at the point of contact between the roll and surface of the galvanized workpiece. The oxide coating on the roll has little or no affinity for the galvanized coating.

3,698,939

METHOD AND COMPOSITION OF PLATINUM PLATING

Frank H. Leaman, 1613 N. Harrison St., York, Pa. 17402

No Drawing. Filed July 9, 1970, Ser. No. 53,639

Int. Cl. C23c *3/02*

U.S. Cl. 117—130 **11 Claims**

A method is provided for the electroless platinum plating onto metals and alloys of metals more noble than copper and onto non-conductive materials by the chemical reduction of platinum from an aqueous alkaline solution containing a chloroplatinate complex.

3,698,940

METHOD OF MAKING ADDITIVE PRINTED CIRCUIT BOARDS AND PRODUCT THEREOF

Mark Mersereau, Cheshire, Harold L. Rhodenizer, Bethlehem, John J. Grunwald, New Haven, and William P. Innes, Cheshire, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

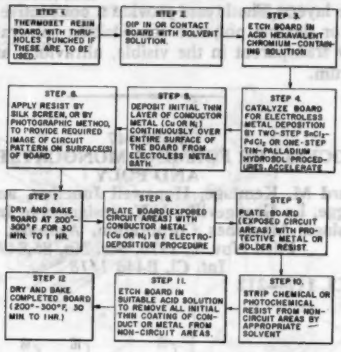
Continuation-in-part of application Ser. No. 834,982, June 20, 1969. This application Jan. 26, 1970, Ser. No. 5,881

Int. Cl. B44d *1/18*

U.S. Cl. 117—212 **23 Claims**

A method is disclosed for forming printed circuit boards by the additive process, in which the surface of

the substrate is contacted with a particular class of solvents, prior to electroless deposition of the metal thereon,


STEP 1. THERMOSET RESIN BOARD, WITH THRU-HOLES PUNCHED IF THESE ARE TO BE USED.
STEP 2. DIP IN OR CONTACT BOARD WITH SOLVENT SOLUTION
STEP 3. ETCH BOARD IN ACID HEXAVALENT CHROMIUM-CONTAINING SOLUTION
STEP 6. APPLY RESIST BY SILK SCREEN, OR BY PHOTOGRAPHIC METHOD, TO PROVIDE REQUIRED IMAGE OF CIRCUIT PATTERN ON SURFACE(S) OF BOARD.
STEP 5. DEPOSIT INITIAL THIN LAYER OF CONDUCTOR METAL (Cu OR Ni) CONTINUOUSLY OVER ENTIRE SURFACE OF THE BOARD FROM ELECTOLESS METAL BATH
STEP 4. CATALYZE BOARD FOR ELECTROLESS METAL DEPOSITION BY TWO-STEP $SnCl_2$-$PdCl_2$ OR ONE-STEP TIN-PALLADIUM HYDROSOL PROCEDURE; ACCELERATE
STEP 7. DRY AND BAKE BOARD AT 200°-300°F FOR 30 MIN. TO 1 HR.
STEP 8. PLATE BOARD (EXPOSED CIRCUIT AREAS) WITH CONDUCTOR METAL (Cu OR Ni) BY ELECTRO-DEPOSITION PROCEDURE
STEP 9. PLATE BOARD (EXPOSED CIRCUIT AREAS) WITH PROTECTIVE METAL OR SOLDER RESIST
STEP 12. DRY AND BAKE COMPLETED BOARD (200°-300°F, 30 MIN TO 1HR.)
STEP 11. ETCH BOARD IN SUITABLE ACID SOLUTION TO REMOVE ALL INITIAL THIN COATING OF CONDUCT OR METAL FROM NON-CIRCUIT AREAS.
STEP 10. STRIP CHEMICAL OR PHOTOCHEMICAL RESIST FROM NON-CIRCUIT AREAS BY APPROPRIATE SOLVENT

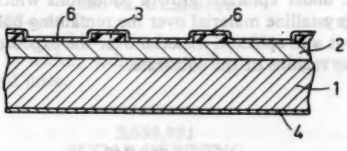
and at one or more points in the process the board is heated or baked.

3,698,941

METHOD OF APPLYING CONTACTS TO A SEMICONDUCTOR BODY

Dirk de Nobel and Jan A. G. de Waal, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,715
Claims priority, application Netherlands, Sept. 26, 1969, 6914593
Int. Cl. B44d *1/18*; H01l *7/00*
U.S. Cl. 117—212 **8 Claims**



A method of locally applying a metal contact to a semiconductor surface, in which the surface is partly covered by an insulating layer, after which a metal layer is applied to the whole surface. By subjecting the metal layer in accordance with the invention to acoustic high-frequency vibrations, the metal layer is removed from the insulating layer and is left adhering to the semiconductor material. The adhesion may be improved by a thermal treatment prior to the vibration treatment.

3,698,942

NOZZLES FOR CONTINUOUS CASTING

David J. Nell, West Mifflin, and Thomas W. Lewis II, Bethel Park, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,222
Int. Cl. C04b *41/24*
U.S. Cl. 117—123 A **3 Claims**

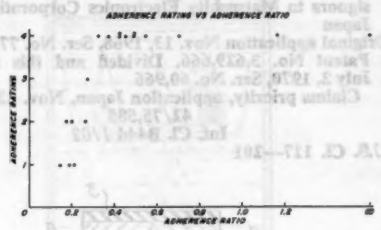
As nozzles for continuous casting, ceramically bonded zircon or zirconia partially impregnated with noncolloidal chromic oxide, zircon, or zirconia particles.

3,698,943

PROTECTIVE COATING

William R. Colantuono, Pittsburgh, Pa., assignor to Crucible Inc.

Original application May 28, 1968, Ser. No. 732,612. Divided and this application Sept. 3, 1970, Ser. No. 69,439
Int. Cl. B44d *1/34*; C23f *1/44*
U.S. Cl. 117—53 **3 Claims**



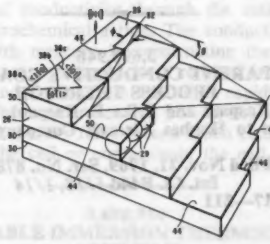
This invention relates to a method for protecting and to a protective coating for use on hot metal workpieces, particularly high-speed tool steels, to protect the surface against scaling and decarburization during elevated-temperature processing from ingot to billet. The coating consists of sodium borate, silica, and a viscosity-promoting agent, such as alumina.

3,698,944

METHOD OF OBTAINING PHASED GROWTH OF EPITAXIAL LAYERS

Lawrence Dean Dyer, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 15, 1970, Ser. No. 46,190
Int. Cl. B01j *17/28*
U.S. Cl. 117—201 **6 Claims**



Disclosed is a method of preparing substrates that have positions at which nucleation preferentially takes place during epitaxial deposition of a material having a substantially different crystal lattice structure than the substrate material. A substrate, oriented to present a preselected low index reference crystal plane, is cut along a plane having a preselected angle of inclination to the low index crystal plane, the axis of inclination also having a preselected angle with a direction of close-packed atoms in the low index crystal plane. These preselected angles are so chosen that crystal steps and kinks are formed in preselected positions along the surface of the substrate. Since nuclei preferentially form at kinks and crystal steps,

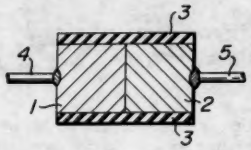
proper selection of the cutting plane enables control of the location of nuclei which are substantially in phase with one another across the substrate surface.

3,698,945

METHOD OF COATING PN JUNCTION OF SEMICONDUCTOR DEVICE WITH MIXTURE OF SiO_2 AND TiO_2

Masami Yokozawa and Hitoo Iwasa, Osaka, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Original application Nov. 13, 1968, Ser. No. 775,355, now Patent No. 3,629,666. Divided and this application July 2, 1970, Ser. No. 60,966
Claims priority, application Japan, Nov. 22, 1967, 42/75,585
Int. Cl. B44d 1/02
U.S. Cl. 117—201 4 Claims



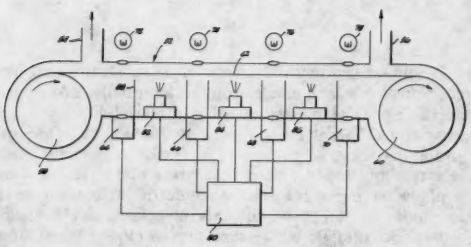
A semiconductor device with at least one PN junction and a method of manufacturing the same wherein a passivating film or a surface film for insulation is made of a chemical mixture of oxides composed of SiO_2–TiO_2 so that the breakdown voltage and electrical stability of said PN junction can be increased. This effect is based on the suppression of movement of alkali ions in said film with the mixture of oxides. The film with the mixture of oxides composed of SiO_2–TiO_2 is obtained with a method where vapors of organo-oxy-silicon compound and organo-oxy-titanium compound are led onto a substrate, which is heated and sustained at a predetermined temperature, and pyrolized on a surface of the substrate to make the film.

3,698,946

TRANSPARENT CONDUCTIVE COATING AND PROCESS THEREFOR

Alfred F. Kaspaul and Erika E. Kaspaul, Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 21, 1969, Ser. No. 878,698
Int. Cl. B44d 1/18, 1/14
U.S. Cl. 117—211 8 Claims



The transparent electrically-conductive coating is a composite layer comprising a first layer deposited as titanium monoxide, a second layer of noble metal and a third layer deposited as titanium monoxide, on a transparent substrate. Each of the layers is sufficiently thin to have a substantial transmissivity to optical radiation.

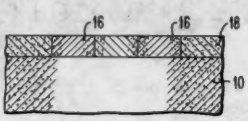
The process comprises successive in-vacuo depositions of the layers. The layers provide a conductive coating on glass or flexible polymer composition substrate which is highly transparent in the visible, ultraviolet and infrared spectrum.

3,698,947

PROCESS FOR FORMING MONOCRYSTALLINE AND POLY

Bernard M. Kemlage, Hopewell Junction, and Hans B. Pogge, La Grangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1970, Ser. No. 85,849
Int. Cl. B44d 1/18
U.S. Cl. 117—212 10 Claims



A method wherein an amorphous material is initially deposited on a monocrystalline substrate and wherein subsequently selected portions of the amorphous layer are removed to expose portions of the surface of the monocrystalline substrate. A thin layer of a polycrystalline semiconductor material is deposited over the whole wafer. The remaining portions of the amorphous layer are removed including the overlying polycrystalline material. A layer of semiconductor material is deposited on the substrate under epitaxial growth conditions which will form polycrystalline material over the remaining polycrystalline regions and epitaxial material over the exposed monocrystalline regions of the substrate.

3,698,948

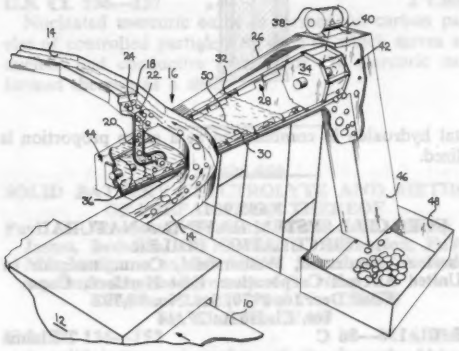
FABRICATION OF A SILICON-SILICON DIOXIDE INTERFACE OF PREDETERMINED SPACE CHARGE POLARITY

Frank J. Barone, Tempe, and Donald L. Tolliver, Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 26, 1968, Ser. No. 748,036
Int. Cl. H01l 7/00; C23c 11/08
U.S. Cl. 117—213 10 Claims

In the fabrication of a semiconductor device having a silicon-silicon dioxide interface, the polarity of the space charge region associated with the interface is predetermined by a method which begins with the step of pretreating the silicon surface with a selected reagent capable of inducing the desired space charge polarity. For example, a pretreatment with chromic acid induces a negative space charge region, whereas a pretreatment with nitric acid induces a positive charge. The interface is then formed by vapor deposition of a silicon dioxide layer on the silicon surface. The pretreatment has been found capable of inducing a predetermined charge when the interface is provided by vapor deposition, but is wholly ineffective when the interface is provided by thermal oxidation. It is well known that thermal oxidation of a silicon surface inherently produces an interface having a positive space charge region.

3,698,949
APPARATUS FOR REMOVING ROCK FROM UNSCREENED SUGAR CANE JUICE
Kenneth E. Steppe, Lambertville, Mich., and Alfred L. Webre, Jr., Marsh Harbour, Bahamas, assignors to Owens-Illinois, Inc.
Filed Nov. 27, 1970, Ser. No. 93,029
Int. Cl. C13d *3/00*
U.S. Cl. 127—9 3 Claims



An apparatus for removing rock from raw and unscreened sugar cane juice which utilizes a dam across the bottom of a trough carrying the juice stream. The dam directs the rock to a vertical trap from which the rock is removed by a conveyor.

3,698,950
METHOD OF INHIBITING THE INVERSION OF SUCROSE IN SUGAR CANE JUICE
Alex G. Alexander, Rio Piedras, Puerto Rico, assignor to to the Commonwealth of Puerto Rico, Rio Piedras, Puerto Rico
Filed Mar. 18, 1971, Ser. No. 125,704
Int. Cl. C13d *3/00*
U.S. Cl. 127—46 R 4 Claims

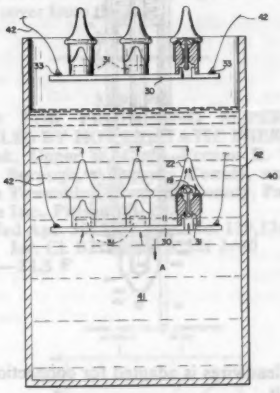
Method for inhibiting the inversion of sucrose in sugar cane juice by adding sodium metasilicate to the pretreated or untreated juice.

3,698,951
SUGAR REFINING
Michael Camm Bennett, London, England, assignor to Tate & Lyle Limited, London, England
Continuation-in-part of application Ser. No. 761,738, Sept. 23, 1968. This application July 17, 1970, Ser. No. 55,723
Claims priority, application Great Britain, Sept. 29, 1967, 44,594/67
Int. Cl. C13d *3/00*; C13f *1/14*
U.S. Cl. 127—48 12 Claims

Sugar liquor is purified by adding cationic surfactants (especially long chain ammonium quaternaries) precipitating a floc. The process combines synergistically with conventional phosphatation and/or carbonatation treatment.

3,698,952
METHOD FOR HANDLING FEEDING DEVICES FOR YOUNG ANIMALS
Brigadier George Patrick Rose-Miller, "Barevan," Cawdor, Scotland
Filed Dec. 24, 1970, Ser. No. 101,304
Claims priority, application Great Britain, Sept. 17, 1970, 44,458/70
Int. Cl. B08b *9/00*
U.S. Cl. 134—22 R 3 Claims

A method for handling feeding devices of the type having an elongated nozzle open at its upper end and connected to a liquid feed vessel, a nipple attached to the lower end of the nozzle for delivering liquid feed to an infant animal which nurses in a standing position, and a valve device in the nozzle for controlling the downward flow of liquid. A mounting plate with at least one



hollow threaded boss is used (a) to hold the nozzle securely while attaching the nipple onto the nozzle, and (b) to hold the feed device inverted while cleaning the device by dropping it downwardly through a cleaning solution such that the liquid flows through the feeding device.

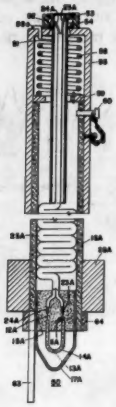
3,698,953
GALVANIC CELL
Morris Eisenberg, Palo Alto, Calif., assignor to Elca Battery Company, Sunnyvale, Calif.
No Drawing. Original application Apr. 22, 1970, Ser. No. 31,021. Divided and this application May 27, 1971, Ser. No. 147,598
Int. Cl. H01m *35/02*
U.S. Cl. 136—20 13 Claims

A galvanic cell is disclosed having a cathode comprising a mercury compound to provide active cathodic electrochemical action during cell operation and conductive powders mixed with the mercury compound to provide mass electrical conductivity through the cathode during cathodic electrochemical action. The conductive powders are coated with mercury in constructing the cathode in order that mercury in liquid form reduced from the mercury compound during cell operation rapidly and uniformly wets the mercury coated powders rather than agglomerate and thereby form means which could internally short-circuit the cell or contaminate the cell anode.

3,698,954
EXPENDABLE IMMERSION THERMOCOUPLE ASSEMBLY
Louis R. Jones, Jr., Abington, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.
Continuation of application Ser. No. 446,000, Apr. 6, 1965. This application Dec. 9, 1968, Ser. No. 796,258
Int. Cl. H01v *1/02*
U.S. Cl. 136—234 12 Claims

An expendable immersion thermocouple assembly for measuring the temperature of a molten bath in a furnace including body structure mounted in one end of a cardboard tube. A coil of heat-insulated leadwires is electrically connected at one end to the thermocouple device. The coil is supported within the cardboard tube with the turns of the coil being in engagement with the inner wall of the cardboard tube, the leadwires having an uncoiled length several feet greater than the length of the cardboard tube for extension therebeyond an adequate dis-

tance to permit the thermocouple device to penetrate to a subsurface level of the molten bath while the opposite

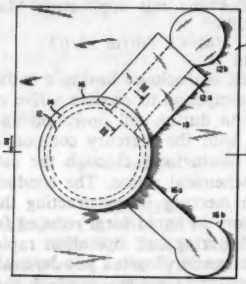


end of the leadwires is adapted for connection to a measuring circuit.

3,698,955
OXYGEN-RESPONSIVE ELECTRICAL CURRENT SUPPLY

Arnys Clifton Lilly, Jr., and Calvin O. Tiller, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 878,287, Nov. 20, 1969. This application June 15, 1970, Ser. No. 46,158
Int. Cl. G01n *27/00*; H01m *11/00*
U.S. Cl. 136—83 R **10 Claims**



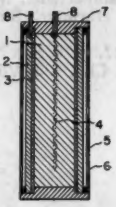
A supply providing electrical current in accordance with both load resistance and environmental oxygen concentration incorporates an electrochemical cell having an anode, a cathode and an electrolyte composed of a rare earth fluoride. A rugged miniature supply adapted for use in space-limited applications is provided by thin film deposition of the cell elements.

3,698,956
ALKALINE ELECTROLYTE-ZINC ANODE AIR-DEPOLARIZED BATTERY

Masayuki Emoto, Tokyo, and Yoshiyuki Maki, Fujisawa, Japan, assignors to Hitachi Limited, Tokyo-to, Japan

Filed July 10, 1970, Ser. No. 53,737
Claims priority, application Japan, July 14, 1969, 44/55,665
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 A **4 Claims**

An air-depolarized battery of the alkaline electrolyte-zinc anode type, in which an alkaline electrolyte-zinc anode composed of amalgamated zinc powder, alkali metal electrolyte and one or more kinds of alkaline earth

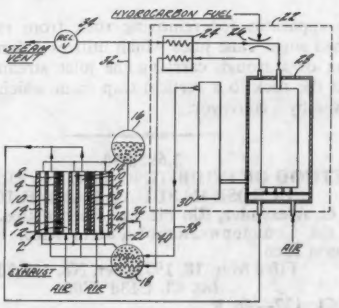


metal hydroxide in combination at a given proportion is utilized.

3,698,957
FUEL CELL SYSTEM HAVING A NATURAL CIRCULATION BOILER

Robert A. Sanderson, Wethersfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 16, 1970, Ser. No. 98,792
Int. Cl. H01m *27/14*
U.S. Cl. 136—86 C **7 Claims**

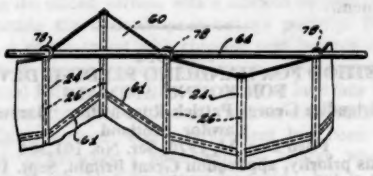


A natural circulation boiler for a fuel cell system is provided which both cools the fuel cell and provides steam for a steam reformer; the boiler is in contiguous heat exchange relationship with the fuel cell.

3,698,958
SOLAR PANEL

Clyde E. Williamson, Los Angeles, and Donald R. Baker, Lawndale, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Original application Feb. 5, 1968, Ser. No. 703,157. Divided and this application Dec. 3, 1969, Ser. No. 881,699
Int. Cl. H01l *15/02*
U.S. Cl. 136—89 **1 Claim**



A solar panel assembly composed of a number of thin film solar cells placed edge-to-edge. The solar cells are fastened along their adjacent edges by strips of tape.

3,698,959

METHOD OF FORMING MERCURIC OXIDE SHELL ON CARBON PARTICLES

Robert O. Weiss, West Milford, N.J., and Robert A. Nikitopoulos, Carmel, and Phillip B. Gunther, Hastings-on-Hudson, N.Y., assignors to P. R. Mallory & Co., Indianapolis, Ind.

No Drawing. Filed May 14, 1970, Ser. No. 37,354
Int. Cl. H01m *15/06*
U.S. Cl. 136—137 2 Claims

Nucleated mercuric oxide is formed on carbon particles of controlled particle size, each of which serves as a nucleus and conductive carrier for the mercuric oxide formed thereon as a shell.

3,698,960

SOLID BATTERY ELECTROLYTE AND METHOD OF PREPARATION THEREOF

Paul H. Arbesman, Danbury, Conn., and Stanley D. James, Bethesda, and Donald L. Warburton, Fulton, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed June 21, 1971, Ser. No. 155,088
Int. Cl. H01m *11/00*
U.S. Cl. 136—153 6 Claims

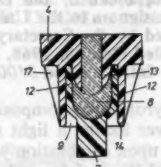
A solid battery electrolyte of the formula MAg_4X_5 wherein M represents K, Rb, NH_4, Co or mixtures thereof provided that Cs is present only as a minor constituent of M, and X represents halogen is prepared by simultaneously subjecting the corresponding dry powders of MAg_4X_5 to heat and pressure. The solid electrolytes thus obtained have very low porosity.

3,698,961

SEALED BATTERY WITH SYNTHETIC RESIN CASE AND COVER

Gert Niemann, Hildesheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 21, 1971, Ser. No. 108,405
Claims priority, application Germany, Jan. 29, 1970, P 20 03 919.4; June 27, 1970, P 20 31 849.4
Int. Cl. H01m *1/02*
U.S. Cl. 136—170 10 Claims



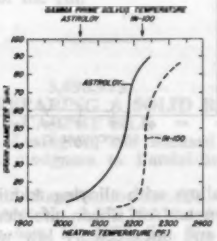
Leak-proof battery enclosure of thermoplastic synthetic resin, wherein each of the case walls has at its upper edge a pair of upwardly extending spaced-apart lips defining a groove, and the cover has walls matching those of the case. Each of the cover walls has at its lower edge a pair of downwardly extending spaced-apart lips defining a groove having along its base a projecting wedge. The distance between the lips on the cover is such that the grooves in the cover each receive both of the lips of an associated pair. The width of the wedge in the base of the grooves in the cover is such that the wedge forces the upper edges of the lips on the case apart and firmly against the inside of the lips on the cover. The cover has filling holes connecting the upper surface thereof with the groove in the cover and a sealing mass fills the continuous channel formed by the groove in the cover and the lips on the case; the sealing mass is inserted under pressure and urges the major portion of the case lips firmly against the inner faces of the cover lips, thereby sealing the cover to the case. The cover lips may have inwardly projecting beads at the lower extremities, thereby affording mechanical support against accidental removal of the cover from the case.

3,698,962

METHOD FOR PRODUCING SUPERALLOY ARTICLES BY HOT ISOSTATIC PRESSING

August Kasak, Upper St. Clair, Vernon R. Thompson, Greentree Borough, Allegheny County, and John H. Moll, Ross Township, Allegheny County, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Apr. 30, 1971, Ser. No. 139,126
Int. Cl. B22f *9/00*; C22f *1/00*
U.S. Cl. 148—11.5 F 15 Claims



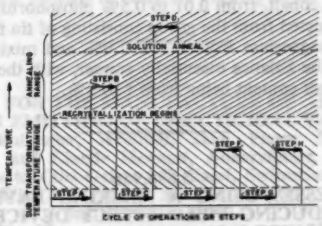
The production of superalloy articles from superalloy powders containing a dispersion of gamma prime particles and an average grain diameter of 20 microns maximum by heating the powder to a temperature at or above a selected compacting temperature but below the temperature at which the gamma prime particles dissolve and isostatically compacting the powder to a density of at least 95% prior to cooling below the selected compacting temperature.

3,698,963

ULTRAHIGH STRENGTH STEELS

John Nunes, Lexington, and Albert D. Martin, Groton, Mass., assignors to Brunswick Corporation

Filed Sept. 21, 1970, Ser. No. 73,962
Int. Cl. C21c *39/00*; C21d *7/02*, *9/02*
U.S. Cl. 148—12.4 14 Claims



An ultrahigh strength material made from ordinary 18–8 stainless steel has a tensile strength in excess of 400,000 p.s.i. The method of producing the ultrahigh strength is accomplished by thermo-mechanical operations. The material can have any desired geometric cross section configuration and is adaptable for use as a spring material.

3,698,964

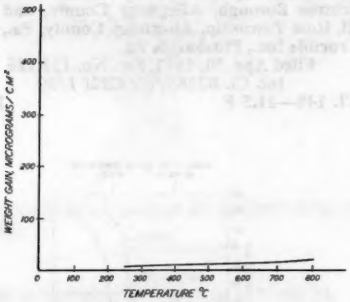
OXIDATION-RESISTANT ARTICLES OF AN IRON BASE ALLOY CONTAINING CHROMIUM AND ALUMINUM AND/OR SILICON

Elmer J. Caule, New Haven, Philip R. Sperry, North Haven, Michael J. Pryor, Woodbridge, and James A. Ford, North Haven, Conn., assignors to Olin Corporation

Original application Aug. 8, 1968, Ser. No. 751,311. Divided and this application Nov. 4, 1970, Ser. No. 86,768

Int. Cl. C22c *39/06, 39/14*

U.S. Cl. 148—31.5 6 Claims



Iron base alloys with alloying additions of chromium and aluminum and/or silicon are described which exhibit unique and unexpectedly low weight gains when exposed to oxidizing environments. One of the major advantages of the group of alloys described herein lies in their moderate cost, especially as compared to other oxidation resistant Fe-base alloys such as the various grades of stainless steel containing at least 11% chromium. The oxidation resistance is imparted to these alloys through the formation of a tenacious compact oxide film consisting essentially of oxides of the alloying additions.

3,698,965

HIGH CONDUCTIVITY, HIGH STRENGTH COPPER ALLOYS

Elmars Ence, Hamden, Conn., assignor to Olin Corporation

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,023

Int. Cl. C22c *9/06*; C22f *1/08*

U.S. Cl. 148—32.5 7 Claims

New and improved copper base alloys combining high conductivity with excellent strength, with the composition consisting essentially of from 0.2 to 4.0% iron, from 0.2 to 2.5% cobalt, from 0.01 to 0.5% phosphorus and a material selected from the group consisting of tin from 0.1 to 1.0%, magnesium from 0.1 to 1.0% and mixtures thereof, and the balance essentially copper, with the total iron plus cobalt content being from 1 to 5%.

3,698,966

PROCESSES USING A MASKING LAYER FOR PRODUCING FIELD EFFECT DEVICES HAVING OXIDE ISOLATION

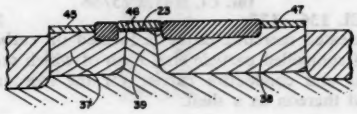
Ronald E. Harris, Placentia, Calif., assignor to North American Rockwell Corporation

Filed Feb. 26, 1970, Ser. No. 14,319

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 3 Claims

Oxide films and a nitride layer are selectively formed over the surface of a semiconductor wafer to define areas of the wafer in which field effect devices are to be formed. The nitride layer masks the inner oxide film as an oxide layer is formed around the masked regions to form laterally isolated semiconductor islands in which the field effect devices are to be formed.



Part of the nitride layer is then used to mask the oxide film defining the gate region of the field effect device. Conductivity regions are formed in the island by diffusion as nitride layers mask the contact regions of the field effect devices. Contacts are formed on the contact regions.

3,698,967

METHOD OF CURING PROPELLANTS CONTAINING CARBOXYL TERMINATED POLYALKADIENES USING AN ORGANIC IRON SALT

Grant Thompson and Bobby M. Wall, Brigham City, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Jan. 29, 1964, Ser. No. 342,592

Int. Cl. C06d *5/06*

U.S. Cl. 149—19 13 Claims

1. A method of producing superior cures in solid propellant compositions containing as its components a carboxyl containing hydrocarbon fuel binder, oxidizer, epoxy resin curing agent and propellant adjuvants, comprising admixing into said solid propellant composition prior to curing, a catalytic amount of an iron salt of a carboxylic acid and allowing sufficient time to elapse until a satisfactory state of cure is obtained.

3,698,968

PYROTECHNIC COMPOSITION

Duane M. Johnson, Bicknell, and Donald R. Razelton, Winslow, Ind., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 28, 1968, Ser. No. 772,067

Int. Cl. C06d *3/00*

U.S. Cl. 149—19 3 Claims

An improved pyrotechnic composition containing potassium iodate, silver iodate, a light metal and an epoxy resin binder which upon combustion yields products which are useful in artificially modifying the weather.

3,698,969

SOLID STABILIZED HYDRAZINIUM DIPERCHLORATE PROPELLANT

Marvin Fein, Westfield, Frank Loprest, Chester, and Donald G. Shaheen, Dover, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Sept. 10, 1965, Ser. No. 486,552

Int. Cl. C06d *5/06*

U.S. Cl. 149—19 17 Claims

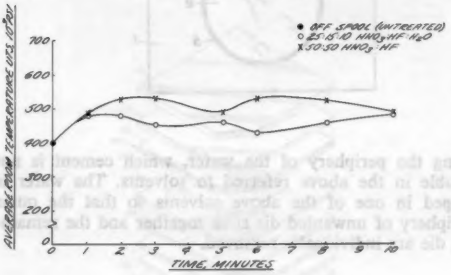
A solid propellant having hydrazinium diperchlorate as the oxidizer in a hydrocarbon fuel binder contains a stabilizing amount of a chelating agent for stabilization with respect to vibrational and thermal shock. Also included are various propellant adjuvants for additional performing characteristics.

3,698,970

METHOD OF STRENGTHENING SILICON CARBIDE COATED BORON FILAMENTS

Francis S. Galasso, Manchester, Bernarr A. Jacob, Torrington, and Jane P. Pinto, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 21, 1970, Ser. No. 99,916
Int. Cl. C23g *1/02*; C01b *35/00*
U.S. Cl. 156—3 7 Claims



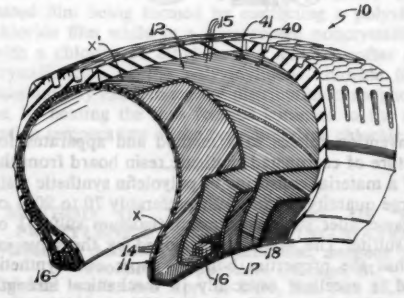
A method for increasing the strength of silicon carbide coated boron filaments comprising subjecting the filaments to an etching solution of nitric and hydrofluoric acid, the solution consisting essentially of, by volume, 10–90% HNO_3, 10–90% HF, and the remainder, if any, H_2O. Further strengthening may be obtained by subjecting the treated filament to heating in air for approximately one hour at a temperature of 900°–1150° C.

3,698,971

METHOD OF MAKING AND INSPECTING PNEUMATIC TIRES HAVING X-RAY OPAQUE CORDS

Harry P. Matthews, Miami, Okla., assignor to The B. F. Goodrich Company, New York, N.Y.

Original application Mar. 20, 1968, Ser. No. 718,973, now Patent No. 3,511,293. Divided and this application Aug. 18, 1969, Ser. No. 850,845
Int. Cl. G01n *19/00*
U.S. Cl. 156—64 4 Claims



The method of inspecting and analyzing a tire which has built into it X-ray opaque cords which lie in the same direction as the other cords in the fabric such that an X-ray of the tire discloses cord angle, tread thickness, and other construction features.

3,698,972

METHOD OF SEALING AND INSULATING A ROOF CONSTRUCTION

James Lenzner, 123 Arizona, Waterloo, Iowa 50703

Filed Aug. 14, 1968, Ser. No. 752,597
Int. Cl. E04b *2/00*
U.S. Cl. 156—71 6 Claims

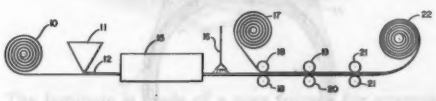
The method including spraying a cellular plastic film onto the roof structure, allowing the cellular plastic to expand to the desired thickness, and shaving the expanded plastic to provide a smooth surface suitable for the application of a built-up roof or other protective coatings. Tar, tar paper and additional tar or other protective coatings are then applied to the smooth expanded plastic. The expanded plastic is shaved by a machine having a rotatable drum and includes adjustment means for varying the thickness of the cut.

3,698,973

METHOD OF PREPARING A SOLID RESIN BACK CARPET TILE

Reuben Wisotzky, Lexington, and Richard E. Petersen, Concord, Mass., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Continuation-in-part of application Ser. No. 687,608, Dec. 4, 1967, now Patent No. 3,560,284, dated Feb. 2, 1971. This application Aug. 12, 1970, Ser. No. 63,227
Int. Cl. C09j *5/08*; D05c *15/03*
U.S. Cl. 156—78 14 Claims



A tufted carpet tile having a thermoplastic resin backing is prepared by applying a heat-sensitive plastisol composition to the back of a material composed of tufted yarns in a thermoplastic base fabric, fusing the plastisol composition to bind the base fabric and tufted yarns together, and laminating the thermoplastic sheet to the plastisol layer using the plastisol layer as the source of sensible heat to melt a thin thermoplastic foam layer on the thermoplastic backing to bond the backing to the plastisol layer.

3,698,974

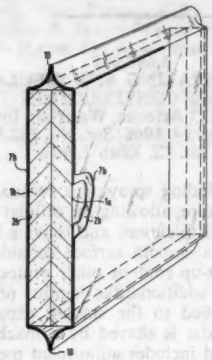
PROCESS FOR THE MANUFACTURE OF APPARATUS FOR EMITTING OF INSECTICIDAL VAPORS

Bernard Rabussier, Aventon, Jean Pierre Mandon, Poitiers, and Claude Hennart, Aubervilliers, France, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed July 7, 1969, Ser. No. 839,721
Int. Cl. B32b *32/00*
U.S. Cl. 156—87 19 Claims

A process for the manufacture of apparatus for emitting insecticidal vapors. A fibrous absorbent mass, flat in shape, is impregnated with volatile insecticidal substance, pure or in solution. At least one of two principal external faces of the fibrous mass is adhered to a diffusion panel, and the fibrous mass and the diffusion panel are mounted

in a mounting of several elements constituted of polymeric plastic material forming together an evaporation apparatus, and a package serving for storage of the apparatus



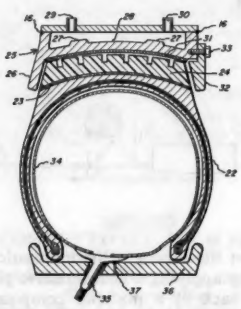
before use, and a system of soldering between the said elements constituting the diffuser, the diffusion panel and the said package.

3,698,975

TIRE RETREADING METHOD

Bernard E. Hogan, Jr., 358 Carol Court, North Mankato, Minn. 56001

Filed Mar. 1, 1971, Ser. No. 119,734
Int. Cl. B29h *5/04, 17/36*
U.S. Cl. 156—96 5 Claims



A method and apparatus is provided for recapping of tires utilizing precured tread. The process and apparatus utilize heat applied from a curing band through the precured tread to cure the cushion gum intermediate the tread and the tire carcass, thereby bonding the two together without significant heating of the carcass sidewall. Adjustment means are provided for the band to compensate for variations in the outer diameter of the carcass being retreaded, as well as for permitting the same band to be used for flat and curved treads.

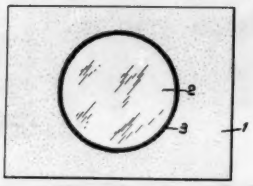
3,698,976

METHOD FOR SORTING DIE

Nelson E. Ake and Harry C. Kling, Boxford, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 19, 1971, Ser. No. 126,024
Int. Cl. B32b *31/00;* B01j *17/00*
U.S. Cl. 156—155 7 Claims

This is a method of removing unwanted die, which die are formed at the periphery of a wafer, from the remaining die which are formed within that periphery. This is accomplished by attaching the wafer to a suitable backing material using a glue which is soluble in water, alcohol or trichloroethylene. The wafer is scribed and fractured into individual die, and a ring of cement is placed



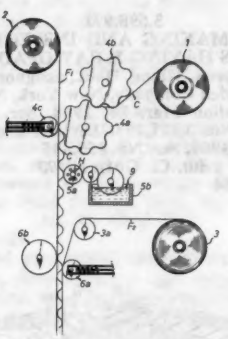
along the periphery of the wafer, which cement is not soluble in the above referred to solvents. The wafer is dipped in one of the above solvents so that the outer periphery of unwanted die stick together and the remaining die are individually removed.

3,698,977

METHOD AND APPARATUS FOR MANUFACTURE OF CORRUGATED SYNTHETIC RESIN BOARD

Rinnosuke Susuki, Tokyo, and Hiroshi Hoshi, Narashinoshi, Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

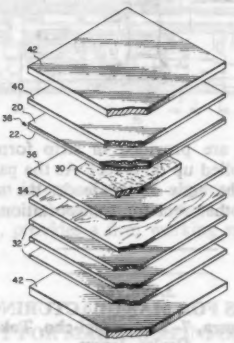
Filed Dec. 16, 1969, Ser. No. 885,461
Claims priority, application Japan, Dec. 17, 1968, 43/92,770
Int. Cl. B31f *1/22*
U.S. Cl. 156—210 2 Claims



The invention relates to a method and apparatus for manufacture of corrugated synthetic resin board from the sheets of a material consisting of polyolefin synthetic resin and a large quantity, 50 to 90%, preferably 70 to 90% of an inorganic filler such as gypsum (calcium sulfate) or calcium sulfite. The material developed by the same inventors has the properties both of paper and synthetic resin and is excellent especially in mechanical strength and resistance to water. The sheet made of said material can be fabricated into corrugated board without deteriorating any property, opposed to the conventional method and apparatus. One flat sheet is adhered to the corrugated sheet by welding or by use of hot melt type adhesives

while another flat sheet is adhered to the other side surface of said corrugated sheet by use of hot melt type adhesives.

3,698,978
REGISTERED EMBOSSED HIGH PRESSURE LAMINATES
John E. McQuade, Jr., Baltimore, Md., assignor to Esso Research and Engineering Company
Filed Apr. 22, 1969, Ser. No. 818,292
Int. Cl. B32b *31/06, 31/12, 31/22*
U.S. Cl. 156—219 **9 Claims**



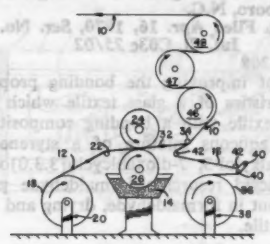
A process for the production of decorative textured and sculptured laminates having a first color and sculptured effect in one area in registry with the remainder of the laminate which has another color and a different texture.

3,698,979
METHOD OF PRODUCING LAMINATED FILM FOR PACKAGING USE
Maurice J. Gifford, Oscar E. Seiferth, and Paul E. Grindrod, Madison, Wis., assignors to Oscar Mayer & Co., Inc., Chicago, Ill.
Continuation of application Ser. No. 612,964, Jan. 31, 1967. This application June 19, 1970, Ser. No. 48,929
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 **7 Claims**

A laminated film for packaging use which film has at least one lamina of a crystalline flexible polyvinylidene chloride film adhered to a lamina of chlorinated polyethylene film, the chlorinated polyethylene film having a chlorine of concentration of up to approximately 60%, by weight, with the particular chlorine concentration of from 30% to 50%, by weight, being preferred. The laminated film being formed by contacting a polyvinylidene chloride film while in a supercooled noncrystalline state with a chlorinated ethylene film and thereafter effecting crystallization of the polyvinylidene chloride film with substantially random crystal distribution throughout, such as, by heating the thus formed laminate to the crystallization temperature of the polyvinylidene chloride.

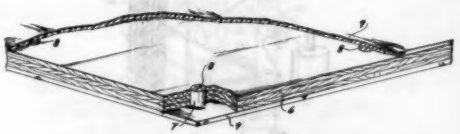
3,698,980
METHOD OF MANUFACTURE OF POLYPROPYLENE FABRIC WRAPPING MATERIAL
William P. Addison, Jr., Atlanta, Ga., assignor to Allied Products Corporation, Chicago, Ill.
Original application Apr. 6, 1970, Ser. No. 25,796, now Patent No. 3,551,267, dated Dec. 29, 1970. Divided and this application Aug. 3, 1970, Ser. No. 67,667
Int. Cl. B32b *11/06;* **D03d** *11/00;* **D21h** *1/08*
U.S. Cl. 156—282 **5 Claims**

Paper, asphalt, and fabric of woven strands of longitudinally oriented polypropylene are laminated by a continuous method in spite of the fact that the softening point of polypropylene is below the laminating temperature of the asphalt. The resulting carpet wrap is more durable,



cheaper, stronger and better looking than paper-burlap laminates used heretofore, and yet has much lower bulk density.

3,698,981
POLYESTER LAMINATE AND METHOD FOR MANUFACTURE
Frank Fekete, Monroeville, David J. Thrash, Ruffs Dale, and Leonard J. Pulman, Pittsburgh, Pa., assignors to Koppers Company, Inc.
Continuation-in-part of application Ser. No. 798,951, Feb. 13, 1969. This application July 15, 1969, Ser. No. 841,744
Int. Cl. B32b *31/04*
U.S. Cl. 156—293 **3 Claims**



The laminate is made of a core formed for example of a plurality of plies of wood, with apertures extended through the core, and having sheets of fiber reinforced polyester resin material cured under pressure at opposite faces of the core, and further having fiber reinforced polyester resin plugs infilling the apertures in the core and cured and inter-bonded with the polyester resin sheets at opposite faces of the core, thereby providing against delamination of the plies of the core.

3,698,982
METHOD FOR BONDING CURED SILOXANE RESIN SURFACES
Philip Alfred Griffin, Sully, Wales, assignor to Dow Corning Limited, London, England
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,188
Claims priority, application Great Britain, Oct. 27, 1969, 52,576/69
Int. Cl. B32b *27/16, 27/26*
U.S. Cl. 156—308 **5 Claims**

Cured silicone resin surfaces, whether supported as on glass cloth or metal, or unsupported can be bonded together by applying to one or both of the cured silicone resin surfaces a known siloxane rearrangement catalyst having an activation and decomposition temperature below about 300° C., bringing the surfaces into intimate contact with each other with the rearrangement catalyst between the surfaces and heating the assembly to activate the rearrangement catalyst.

3,698,983

METHOD OF IMPROVING THE ADHESION OF GLASS CLOTH TO RUBBER

Michael I. Bryant, High Point, and Charles E. Jones, Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,302
Int. Cl. C03c *25/02*
U.S. Cl. 156—308 4 Claims

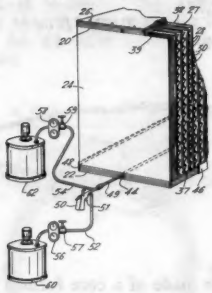
A method of improving the bonding properties and other characteristics of a glass textile which comprises treating said textile with a bonding composition which comprises an aqueous mixture of a styrene-butadiene latex, 1-aza-5-alkylol-3, 7-dioxabicyclo[3.3.0]octane and a partially reacted resorcinol-formaldehyde prepolymer which is deficient in formaldehyde, drying and curing the thus treated textile.

3,698,984

METHOD OF SEALING FILTER CORES TO FRAME MEMBERS

Roger T. Goulet, Liverpool, and Ernest R. Zednik, East Syracuse, N.Y., assignors to Cambridge Filter Corporation, Syracuse, N.Y.

Original application Apr. 8, 1968, Ser. No. 719,628. Divided and this application Apr. 2, 1970, Ser. No. 29,715
Int. Cl. B29c *19/00;* B32b *31/00*
U.S. Cl. 156—293 7 Claims



Filter having a rectangular frame, the top and bottom frame members having a central groove on their inside face extending to at least one end of the top and bottom members, a filter core within the frame having a length of sheet filter media disposed in pleated formation within the frame, with the respective end edges of the media sealed to the frame end members, and the pleated side edges of the filter embedded in a slab of sealant extending across the inside faces of each of the top and bottom frame members and filling the grooves of said top and bottom members and the method of injecting the sealant in liquid form by means of the groove.

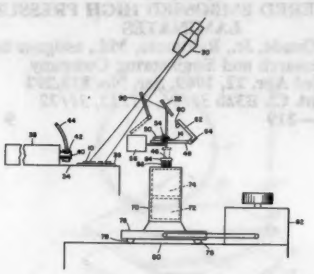
3,698,985

HIGH SPEED MACHINE FOR BONDING FRAME LEADS TO BONDING PADS ON CIRCUIT CHIPS

Peter T. Robinson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 25, 1970, Ser. No. 22,446
Int. Cl. B32b *31/16*
U.S. Cl. 156—379 9 Claims

A machine is provided for properly positioning a chip with respect to a frame member and for simultaneously bonding all frame member lead ends to respective bonding pads of a semiconductor integrated circuit chip. The machine features a rough orientation and a close orientation of the chip to cause registering of the chip pads with the lead ends, both orientations being visual. During the orientation process, the chip pads are visible and during the close orientation process, the relative position of the chip pads and the lead ends are visible. Many sheet



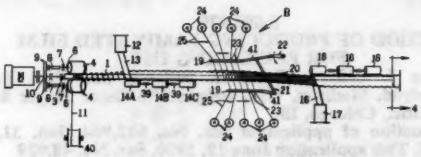
frame members are provided in strip form, said strip being supplied rolled up on a reel. As the pads on a chip are bonded to the ends of the leads, the strip may be rolled up on another reel for transportation purposes.

3,698,986

APPARATUS FOR MANUFACTURING HOSE

Akira Okmura, 7–2 Sawaragi-cho, Takatsuki, Osaka, Japan

Original application Oct. 30, 1968, Ser. No. 771,928, now Patent No. 3,607,501, dated Sept. 21, 1971. Divided and this application July 13, 1970, Ser. No. 54,516
Int. Cl. B32b *31/30;* B31c *13/00;* B65b *81/06*
U.S. Cl. 156—393 2 Claims



An apparatus for manufacturing a hose free of internal stress but having high flexibility by continuously winding a synthetic resin strip extruded from an extruder in half-molten state around a spiral member on a rotary shaft which has fully been restored by the resiliency of its own to the natural condition after having been spirally wound on the shaft.

3,698,987

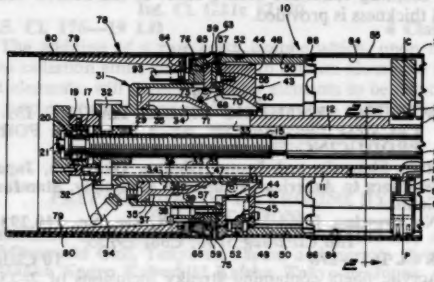
TIRE BUILDING DRUM

Edwin S. Woodhall and Paul F. Appleby, Cuyahoga Falls, and John W. Touchette, North Canton, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 18, 1970, Ser. No. 99,428
Int. Cl. B29h *17/22*
U.S. Cl. 156—401 43 Claims

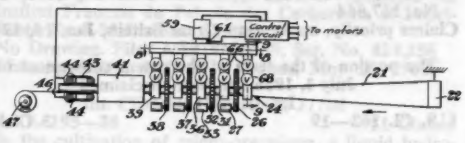
A tire building machine comprising an expansible drum on which tires are built. The drum includes a pair of sets of segments movable radially of the drum axis and which are covered with a rubber sleeve and are disposed between two sets of fingers which are also movable radially of the drum axis. The fingers are designed to hold a pair of wire beads concentrically of the longitudinal axis of the building drum in equidistant spaced relation from the centerplane of the drum. The segments are movable radially outwardly of the drum to form shoulders in the carcass plies on which the beads may be seated, after

which the turn-up of the plies and tie-in of the wire beads are made, and tread and sidewall are applied to complete the uncured tire. The fingers and segments have rigid material engaging surfaces. The center section of the



building drum intermediate the segments has a substantially rigid material supporting surface and, together with the segments, provides a firm working surface for building the tire.

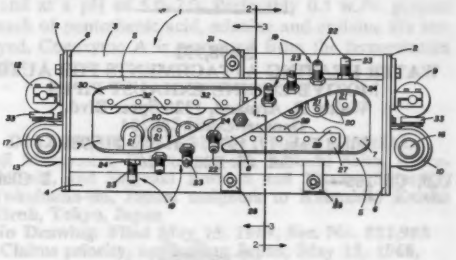
3,698,988
EQUIPMENT FOR MAKING REINFORCED TUBING
Max Skobel, Edison, N.J., assignor to Dow Corning Corporation, Midland, Mich.
Filed June 10, 1971, Ser. No. 151,679
Int. Cl. B29d *23/12*
U.S. Cl. 156—428 **11 Claims**



Equipment for making tubing of extruded rubber or plastic reinforced with fabric webs, on a continuous basis. A sacrifice web is transversely bowed around and pulled over a stationary cylindrical mandrel and alternate extruded layers and helical wrappings of reinforcement material are laid down on the sacrifice web which can be removed from the tubing after it is completed and cut to length.

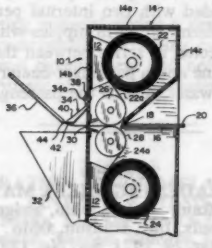
3,698,989
MACHINE FOR LAMINATING SURFACE TEXTURED FILM ON STRIP MOLDING
Theodore Voorhees, 331 Greenacres Drive, Anderson, Calif. 96007
Continuation-in-part of application Ser. No. 865,019, Oct. 9, 1969. This application Sept. 4, 1970, Ser. No. 69,552
Int. Cl. B32b *31/04*
U.S. Cl. 156—479 **2 Claims**

A machine for laminating film, preferably of vinyl and surface-textured to represent an expensive wood such as walnut or mahogany, on strip molding of inexpensive wood; the machine being comprised of a frame provided with means to advance a strip of molding in a predetermined lineal path through such frame, such molding and a run of the film being simultaneously fed to the machine in fact-to-face relation; the film having pre-applied adhesive on the face thereof adjacent the molding, and a frame-mounted pressure roller assembly co-



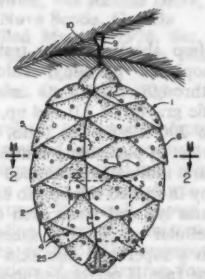
operating with advancing strip molding and film smoothly to bond the film to said molding.

3,698,990
TEAR-OFF BLADE ARRANGEMENT FOR LAMINATING MACHINE
John T. Shields, Terre Haute, Ind., assignor to Marlan Company
Filed Mar. 12, 1971, Ser. No. 123,678
Int. Cl. B26f *3/02*; B32b *31/18*
U.S. Cl. 156—522 **5 Claims**



A tear-off blade arrangement for a plastic laminating machine having a cutting edge spaced from the outfeed slot of the laminator and oriented at an angle relative to the path of travel of the laminated product.

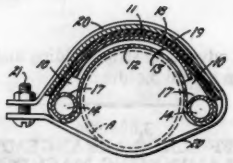
3,698,991
FRAGRANCE EMITTING ARTICLE FOR ARTIFICIAL CHRISTMAS TREES
Michael Bernard Susewitz, 18435 Garfield, Detroit, Mich. 48240
Filed Aug. 25, 1969, Ser. No. 852,545
Int. Cl. A47g *33/08*
U.S. Cl. 161—14 **5 Claims**



A simulated pine cone article for artificial Christmas trees. The article encloses a block of concentrated pine

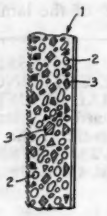
essence in its interior. The article may be made of plastic with two removable sections to allow access to replace the source of pine essence.

3,698,992
WATER HEATING ATTACHMENTS FOR AUTOMOTIVE ENGINE EXHAUST PIPES
Walter R. Armand, 1320 Speer Blvd., Denver, Colo. 80204
Filed Feb. 17, 1971, Ser. No. 115,959
Int. Cl. F28d 7/10
U.S. Cl. 165—51 2 Claims



An elongated water jacket of inverted U-shaped cross section adapted to be externally fitted over and clamped against one side of the exhaust pipe of the engine of an automotive vehicle so as to partially enclose the pipe. The jacket being provided with two internal perforated water distributing pipes terminating in nipples which enable the jacket to be connected in series between the water jacket of the vehicle engine and a passenger-heater in the vehicle for supplying hot water heat to the passenger-heater.

3,698,993
SOUND DEADENING SHEET MATERIAL
John H. Rauh, Akron, Ohio, assignor to Sonix, Inc., Hudson, Ohio
Filed Mar. 29, 1971, Ser. No. 129,037
Int. Cl. B32b 3/26, 5/18; G10k 11/04
U.S. Cl. 161—159 10 Claims

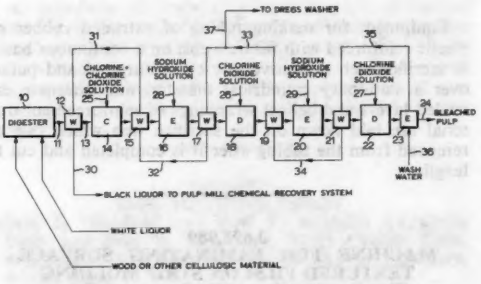


A unitary limp sheet of soft, resilient, closed cell, foamed thermoplastic polyvinyl chloride having distributed therethrough particulate matter of irregular shape, of specific gravity of 3.0 and up, and of sizes ranging from 40 to 200 mesh. The ratio, by weight, of the polyvinyl chloride to particulate matter is about 1 to 6. The particles are individually bonded to sheet material and held thereby in spaced relation to each other throughout the mass and isolated from each other by the sheet material and cellular spaces. The sheet is from ⅛ to ¼ inch thick, with a superficial thin skin on opposite faces. The skin on one face is perforated mechanically by tearing it to partially shred it and a superficial juxtaposed stratum of the body of the sheet to produce a fibrous surface on that face. The sheet is formed by placing in an extruder a mixture of the visco-elastic semi-plastic binder powder, a foaming agent powder, and the high density particles; extruding the mixture under heat by which it is melted to a flowable semi-plastic mass which immediately begins foaming. The extrusion is fed into calendar rolls and sizing rolls and therefrom passes onto a belt wherein the foaming continues until a sheet of the desired width and thickness is provided.

3,698,994
ACRYLIC SYNTHETIC FIBERS HAVING IMPROVED PROPERTIES AND PROCESS FOR PRODUCING THE SAME
Keitaro Shimoda and Isamu Obama, Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Jan. 27, 1971, Ser. No. 110,293
Int. Cl. D02g 3/00; C08f 29/56
U.S. Cl. 161—178 10 Claims

Acrylic fibers containing streaky inclusions of 2–25% polyvinyl cyanoethyl ether of DS value between 55% and 75% having improved luster, softness, hygroscopic, and antistatic properties. Such fibers are made by wet-spinning a solution of the polyvinyl cyanoethyl ether and the acrylonitrile polymer in a common solvent, water-washing, stretching, and dry-heat drying the fibers so spun.

3,698,995
DIGESTION AND BLEACHING OF WOOD PULP FOLLOWED BY RECOVERY OF CHEMICALS AND COUNTERCURRENT FLOW OF WASH WATER
William H. Rapson, Toronto, Ontario, Canada, assignor to Electric Reduction Company of Canada, Ltd.
Continuation of abandoned application Ser. No. 695,159, Jan. 2, 1968. This application Feb. 22, 1971, Ser. No. 117,664
Claims priority, application Great Britain, Jan. 16, 1967, 2,240/67
The portion of the term of the patent subsequent to July 1, 1986, has been disclaimed
Int. Cl. D21c 3/26
U.S. Cl. 162—19 3 Claims



Digesting wood in a pulping liquor followed by washing, bleaching, and extracting of the pulp, and concentrating and subjecting the liquor to reducing conditions to recover chemicals, wherein at least part of the wash water obtained from washing bleached cellulosic pulp or from washing bleached and extracted cellulosic pulp is employed to wash unbleached cellulosic pulp thereby providing countercurrent flow of wash water.

ERRATUM

For Class 165—51 see:
Patent No. 3,698,992

3,698,996

METHOD OF DETECTING THE PRESENCE OF A DEFECTIVE LITHIUM-ALUMINATE TARGET IN A REACTOR

Raymond Cooperstein, 2529 Harris Ave., Richland, Wash. 99352

No Drawing. Filed Nov. 24, 1970, Ser. No. 87,369
Int. Cl. G21c *17/00*
U.S. Cl. 176—19 LD 4 Claims

The addition of a rare earth isotope which, upon neutron radiation emits gamma rays to lithium-aluminate target elements, will permit defective elements to be detected in reactors by monitoring the effluent for gamma radiation.

3,698,997

PREPARATION OF L-TYROSINE BY FERMENTATION

Katsunobu Tanaka, Kazuo Ohshima, Yoh Tokoro, and Mitsuyoshi Okii, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,603
Claims priority, application Japan, Mar. 29, 1968, 43/20,031
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R 7 Claims

L-tyrosine is prepared by culturing a hydrocarbon assimilable microorganism which requires phenylalanine for its growth. Microorganisms of the genera Corynebacterium, Brevibacterium, Arthrobacter, etc. are particularly suitable for use in the process.

3,698,998

PROCESS FOR CULTIVATING MICRO-ORGANISMS IN THE PRESENCE OF HYDROCARBONS

René Avrillon, Maisons-Lafitte, Sigismond Franckowiak, Montesson, Claude Gatellier, Boulogne, and Georges Glikmans, Meudon-la-Foret, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed May 13, 1969, Ser. No. 824,256
Claims priority, application France, May 15, 1968, 151,959
Int. Cl. A23j *1/18;* C12c *11/08*
U.S. Cl. 195—28 11 Claims

In the cultivation of micro-organisms, a liquid hydrocarbon feedstock is employed containing at least 70% by weight of linear paraffinic hydrocarbons. The growing step is conducted in the presence of a gas-containing molecular oxygen and with a nutrient aqueous medium containing: (a) assimilable nitrogen and phosphorus; (b) oligoelements such as trace amounts of copper, cobalt, iron, molybdenum and manganese compounds; (c) growth factors such as yeast, etc.; and (d) essential mineral elements such as potassium, ammonium and magnesium ions. The micro-organisms are then recovered from at least the major part of unconverted hydrocarbons, preferably by decantation, and then subjected to a maturation step in an aqueous medium similar to the nutritive aqueous medium, but deprived of at least one of the essential mineral elements.

3,698,999

FERMENTATIVE PREPARATION OF COENZYME A

Ichiro Chibata, Suita, Toshio Kakimoto, Sakai, and Takeji Shibatani and Noriyuki Nishimura, Kobe, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,367
Claims priority, application Japan, Mar. 14, 1970, 45/21,862
Int. Cl. C12d *13/00*
U.S. Cl. 195—29 12 Claims

A coenzyme A-producing microorganism selected from the group consisting of *Sarcina lutea, Sarcina aurantiaca, Microbacterium flavum* and *Micrococcus rubens* is cultivated in a nutrient medium under aerobic conditions and in the presence of pantothenic acid, adenine and cysteine. The cultivation is preferably carried out at about 30–37° C. and at a pH of 5.0–7.0. Preferably 0.5 w./v. percent of each of pantothenic acid, adenine and cysteine are employed. Coenzyme A is recovered from the fermentation broth.

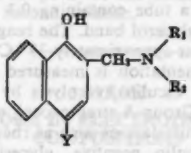
3,699,000

DIAZOTYPE PHOTOPRINTING MATERIAL

Shoji Maruyama, Sagamihara-shi, Tadashi Saito, Kawasaki-shi, and Shigeaki Yoshida and Masaru Shimada, Yokohama-shi, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Filed May 15, 1969, Ser. No. 821,968
Claims priority, application Japan, May 15, 1968, 43/32,228
Int. Cl. G03c *1/58*
U.S. Cl. 96—91 1 Claim

Diazotype photoprinting material containing as a coupling component a compound of a general formula:



said photoprinting material giving a dense dye-image and having high preservability and being capable of using in both dry and wet development and not giving change of color of the substrate of the printed material.

3,699,001

PREPARATION OF BROMELAIN FROM PINEAPPLE STEMS

Pinnan Soong, 12, Lane 322 Ta-Tung Road, Tainan, Taiwan, Kiangsu, China

No Drawing. Filed Jan. 2, 1970, Ser. No. 427
Int. Cl. C07g *7/022*
U.S. Cl. 195—66 R 10 Claims

A practical and economical process for increasing the yield, the purity, the activity and longer shelf-life of bromelain from pineapple stems comprises extracting juice from low temperature treatment of stems, fractionally precipitating bromelain from clarified juice with organic compound and releasing bromelain precipitate with chilled oxygen compounds.

3,699,002

DEXTRAN HYDROLIZING ENZYMES

Robert G. Brown, 946 Ritchie Drive, Halifax, Nova Scotia, Canada

No Drawing. Filed Mar. 6, 1970, Ser. No. 17,343
Claims priority, application Sweden, Mar. 11, 1969, 3,299/69
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 10 Claims

This invention relates to the manufacture of enzyme dextranase by a method which consists essentially of cultivating a microorganism that will grow on the carbon of ketodextran as its energy source in a substrate containing ketodextran. It is well known to make dextranase by cultivating a suitable microorganism on a substrate containing dextran. The essence of this invention is the substitution of ketodextran for dextran. This substitution results in very much increased yields of dextranase. The microorganism must be selected and must be one that will grow on the carbon of ketodextran as its energy source.

3,699,003

DIAGNOSTIC PREPARATION FOR THE IDENTIFICATION OF β-HEMOLYTIC STREPTOCOCCI

Donald P. Kronish, Rockaway, and Lee S. Zuriff, Parsippany, N.J., assignors to Warner-Lambert Company

Filed July 13, 1970, Ser. No. 54,277
Int. Cl. C12k 1/04
U.S. Cl. 195—103.5 R 8 Claims

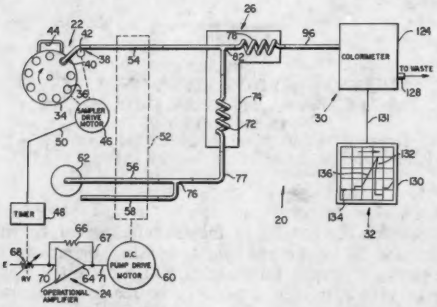
A preparation for the biochemical identification of β-hemolytic streptococci into serologic groups, e.g., groups A, B, C, D, etc., is disclosed. This preparation comprises a carrier, e.g., a bibulous strip containing a glycerol reagent band, a salicin reagent band and an esculin reagent band. In the glycerol and salicin reagent bands there are also pH indicator systems. The esculin band contains a compound which reacts with esculin breakdown products to produce a color change. These bands are separated from each other by hydrophobic barriers. In use, a quantity of the beta hemolytic streptococcus whose serological identification is to be determined is transferred onto each of the three reagent bands. A drop of saline or water is added to the salicin area and to the esculin area. The strip is placed in a tube containing 0.3 ml. of saline or water to wet the glycerol band. The reagent impregnated strip is incubated at approximately 37° C. for two to four hours. Sugar fermentation is measured by an indicator color change and esculin hydrolysis by formation of a grey-black color. Group A streptococci, which cause most of the clinical manifestations such as rheumatic fever and nephritis, are esculin negative, glycerin negative and salicin positive. Group B and C streptococci may be involved in diseases but more often are part of a normal flora in a primary isolation blood plate showing β-hemolysis. It is important to differentiate between these groups and Group A. Group D streptococci, known as enterococci, are often associated with urinary tract infection and rapid identification of these organisms is also clinically important.

3,699,004

METHOD AND APPARATUS FOR SAMPLE ANALYSIS ON A CONTINUOUS FLOW BASIS

Leonard T. Skeggs, Kirtland, Ohio, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,297
Int. Cl. G01n 31/14
U.S. Cl. 195—103.5 R 14 Claims



New and improved method and apparatus for the fully automatic, highly accurate quantitative analysis of a series of samples with regard to a constituent thereof on a continuous flow basis through rate reaction determination are provided and are operable through the continuous mixing of said samples and a suitable reactant in constant proportion, and the flow of the resultant sample-reactant mixtures by pumping on a continuous basis through reaction promoting means to promote the sample constituent-reactant rate reaction in such manner that different portions of each of the sample-reactant mixtures are reacted for different times to effect a differential in a characteristic of said mixtures as developed as a result of said reaction. Following this, the thusly reacted sample-reactant mixture portions are flowed through detector means for detection of said characteristic differential and resultant provision of and output signal which is indicative of the sample constituent quantity of interest. Substantially hyperbolic variation in the flow rate of each of said sample-reactant mixtures through said reaction promoting means is utilized to provide for the different sample-reactant mixture portion reaction times. As specifically disclosed herein, the method and apparatus of the invention are particularly adaptable to the analysis of a series of blood samples with regard to an enzyme constituent thereof.

3,699,005

METHOD AND ARTICLE FOR DETECTING THE FERTILE PERIOD

Raymond O. Foster, 1202 Clara St., Joliet, Ill. 60435

No Drawing. Continuation-in-part of abandoned application Ser. No. 597,547, Nov. 29, 1966. This application Aug. 26, 1970, Ser. No. 67,258
Int. Cl. G01n 31/14
U.S. Cl. 195—103.5 R 6 Claims

A new and rapid test method is provided for predicting and detecting the fertile period of the female. The method involves a simple rapid test for alkaline phosphatase activity in the saliva of the female. In the method the female wets a novel test implement with her saliva and the test implement will turn a detectable blue color in about one minute if an amount of alkaline phosphatase is present in the saliva sufficient to cause the color change. This amount of alkaline phosphatase is coincident with the onset of the fertile period of the female, and extends for the duration of the fertile period. The novel dry test implement consists of a dry bibulous material which has been impregnated before drying with an indoxyl phosphate and a buffer.

3,699,006

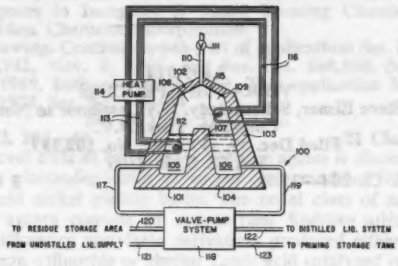
VACUUM STILL HAVING HEAT EXCHANGE COILS AND PARTICLE MEANS THEREWITH

James G. Hasslacher, 7010 University Drive, Richmond, Va. 23229

Filed Aug. 14, 1970, Ser. No. 63,863
Int. Cl. B01d 3/10
U.S. Cl. 203—4 6 Claims

A method and apparatus for distilling liquids including a closed housing vertically divided into feed and distillate compartments having respectively intercommunicating evaporation and condensation chambers thereabove. A vacuum is induced in the chambers by introducing a priming charge to fill the housing and expel the free gases from a vent in the top, followed by closing the vent and discharging a portion of the priming charge. Distillation is accomplished by heating the liquid in the feed compartment to produce vapor in the evaporation chamber and by cooling the vapor transmitted to the condensation chamber to produce distillate which drips into the bottom of the distillate compartment. An irreversible heat pump may be the main source of both heat and cold. The transmission of vapor from evaporation to condensation chambers may be increased by using a ducted fan, which would also serve both to decrease the vapor pressure in the evaporation chamber and to increase the vapor pressure in the

condensation chamber. To prevent the sudden formation of large amounts of vapor on the heating coils in the feed compartment, nonbuoyant spheres may be used on top of the coils and buoyant spheres may be used below the coils.



To increase the surface of the water in the evaporation chamber, jets operating by the suction of the vacuum may be used to inject the liquid into the chamber or into the feed compartment.

3,699,007

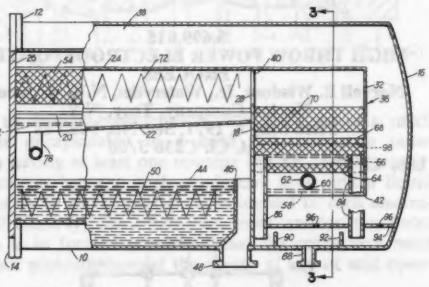
EVAPORATING-CONCENTRATING APPARATUS AND METHOD

Charles Richard Picek, Cheshire, and Cornelis van Hoek, Niantic, Conn., assignors to American Machine & Foundry Company

Continuation of abandoned application Ser. No. 825,488, May 19, 1969. This application Mar. 12, 1971, Ser. No. 123,886

Int. Cl. B01d *3/22, 47/00*

U.S. Cl. 203—40 **8 Claims**



The invention is for an evaporating-condensing concentrator and for a method which increases the proportion of a solute in a liquid, such as increasing the concentration of boric acid in water. The apparatus is constructed to take advantage of relatively high-velocity flows through sharp-edged orifices of the sieve plates which are used in conjunction with drowned mesh scrubbers, thereby affording an unusually low carry-over of solids and gases in the distillate while greatly reducing the space required by conventional constructions. Moreover, the apparatus and method preferably includes means and process steps for recycling or refluxing at least part of the purified concentrate as cleansing liquid.

3,699,008

PROCESS FOR THE PURIFICATION OF CRUDE PHTHALIC ANHYDRIDE BY PLURAL STAGE VACUUM DISTILLATION WITH SIDE STREAM PRODUCT RECOVERY

Dieter Brendt and Gerd Helms, Junkersdorf, and Gerhard Keunecke, Geyen, Germany, assignors to Chemiebau Dr. A. Zieren G.m.b.H. & Co. KG, Cologne-Nuengersdorf, Germany

Filed June 18, 1969, Ser. No. 834,275

Claims priority, application Germany, July 3, 1968, P 17 68 817.4

Int. Cl. B01d *3/10;* **C07c** *63/18*

U.S. Cl. 203—72 **14 Claims**

A process for the purification of phthalic anhydride from a crude oxidation product of naphthalene or o-xylene wherein the purification can be carried out by continuously fractionally distilling the crude product in two columns. The pure phthalic anhydride is withdrawn in the vapor phase in the second column between the sump and the feed point of the distillate from the first column to the second column.

3,699,009

USE OF COKE IN ELECTRODEPOSITABLE COMPOSITIONS

Joseph E. Plasynski, Arnold, and Robert D. Jerabek, Glenshaw, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,266

Int. Cl. B01k *5/02;* **C23b** *13/00*

U.S. Cl. 204—181 **5 Claims**

This invention relates to novel, pigmented, electrodepositable compositions. More particularly, this invention relates to the use of coke in pigmentary form to produce black, grey or dark-colored electrodepositable compositions.

3,699,010

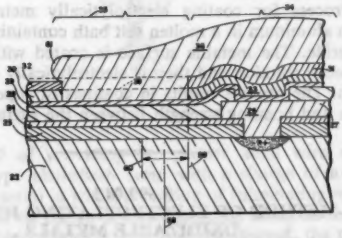
BEAM LEAD PLATING PROCESS

Michael T. Nash, Orange, Calif., assignor to North American Rockwell Corporation

Filed Mar. 22, 1971, Ser. No. 126,810

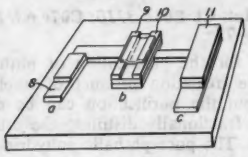
Int. Cl. C23b *5/48;* **B23k** *31/02;* **B29c** *17/08*

U.S. Cl. 204—15 **6 Claims**



A nickel (or copper) layer on the surface of a semiconductor wafer is etched to define a pattern for the cantilevered portions of beam leads. The remaining portion of the layer is not removed for providing an improved electrical conductor on the surface of the semiconductor wafer when gold beam leads are subsequently electrodeposited.

3,699,011
METHOD OF PRODUCING THIN FILM INTEGRATED CIRCUITS
Takeo Nishimura, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Continuation-in-part of application Ser. No. 533,015, Mar. 9, 1966. This application Oct. 16, 1968, Ser. No. 768,089
Claims priority, application Japan, Mar. 18, 1965, 40/15,329
Int. Cl. C23b *5/48*; C23f *17/00*; H02b *1/04*
U.S. Cl. 204—15 8 Claims



A method of producing thin film integrated circuits including thin film passive and active elements, which comprises the steps of depositing an anodizable metal on one surface of an insulating substrate, anodic oxidizing the surface portion of the deposited anodizable metal into its oxide layer of a desired sheet resistivity, depositing a conducting metal over the oxide layer, etching the anodizable metal, the oxide layer and the conducting metal in a desired pattern to obtain thin film passive elements such as a resistor and a capacitor, and depositing a semiconductor material to cover two metal layers spaced from each other existing on the oxide layer to obtain a thin film active element.

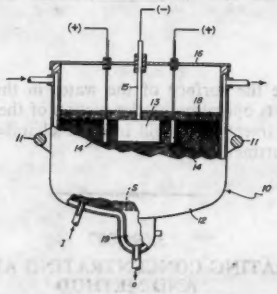
3,699,012
PROCESS FOR THE ELECTROLYTIC FORMATION OF ALUMINUM COATINGS ON METALLIC SURFACES IN MOLTEN SALT BATH
Akira Miyata, Chikayoshi Tomita, and Akio Suzuki, Tokyo, and Hideyo Okubo and Masahiko Nagakuni, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
No Drawing. Original application Nov. 9, 1965, Ser. No. 507,034, now Patent No. 3,480,521, dated Nov. 25, 1969. Divided and this application Mar. 24, 1969, Ser. No. 828,049
Claims priority, application Japan, Nov. 13, 1964, 39/63,827; Feb. 24, 1965, 40/10,330, 40/10,331
Int. Cl. C23b *5/22*
U.S. Cl. 204—29 6 Claims

Process for coating electrolytically metallic surfaces with aluminum in a molten salt bath containing aluminum chloride. The metallic surface is coated with an organic aqueous solution and then is electrolytically coated in the bath. The process results in coatings of superior smoothness and bonding strength between the surfaces.

3,699,013
METHOD OF ELECTROPLATING READILY OXIDIZABLE METALS
Akira Miyata, Hideyo Okubo, Chikayoshi Tomita, and Akio Suzuki, Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha
No Drawing. Filed Aug. 14, 1970, Ser. No. 63,938
Claims priority, application Japan, Aug. 26, 1969, 44/67,048
Int. Cl. C23b *1/00*
U.S. Cl. 204—32 R 11 Claims

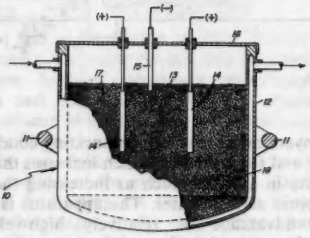
In a method of electroplating readily oxidizable metals and alloys, an article to be plated is first pickled with a mixture of nitric acid and hydrofluoric acid or a mixture of boric acid and hydrofluoric acid, immediately washed with an anhyrous organic solvent, dried by an inert gas or under vacuum, dipped in a plating bath without being exposed to the atmosphere and then after a short time electrolytically plated.

3,699,014
VIBRATORY PROCESS
Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.
Filed Dec. 29, 1970, Ser. No. 102,287
Int. Cl. C23b *3/06*
U.S. Cl. 204—35 R 3 Claims



A process and apparatus for electrodeposition utilizing a liquid electrolyte wherein a very high solid to liquid volumetric ratio of small dynamically hard particles is incorporated in the system and such particles are maintained in a vibratory contact with all surfaces of the article being plated throughout the period of plating.

3,699,015
HIGH THROW POWER ELECTRODEPOSITION PROCESS
Norvell E. Wisdom, Jr., Watervliet, N.Y., assignor to Norton Company, Troy, N.Y.
Filed May 4, 1971, Ser. No. 140,143
Int. Cl. C23b *3/06*
U.S. Cl. 204—35 R 4 Claims



A process for electrodeposition utilizing a liquid electrolyte wherein an extremely high solid to liquid volumetric ratio of small dynamically hard particles is incorporated in the system and vibratory motion imparted to such particles is utilized to carry the electrolyte into the plating zone in contact with all surfaces of the article

being plated throughout the period of plating to give an unusual improvement in the throwing power of the system.

3,699,016

BRIGHT NICKEL PLATING BATH AND PROCESS

Sidney C. Beach and Bernard P. Martin, Cleveland, Ohio, assignors to Inorganic & Metal Treating Chemicals Division, Chemetron Corporation

No Drawing. Continuation-in-part of applications Ser. No. 592,742, Nov. 8, 1966, and Ser. No. 860,008, Sept. 22, 1969, both now abandoned. This application May 20, 1971, Ser. No. 145,474

Int. Cl. C23b *5/08, 5/46*

U.S. Cl. 204—49 21 Claims

A novel class of brightening addition agents is disclosed for the electrodeposition of nickel from modified Watts type acid nickel plating baths. The novel class of addidition agents consists of symmetrical hydroxy sulfonic lower alkanoxy acetylenic derivatives produced either by the boron trifluoride or similar Lewis acid catalyzed reaction of halogenated propylene and butylene oxides with symmetrical acetylenic diols having 4, 6, or 8 carbon atoms, or by first reacting the diols with ethylene, propylene or butylene oxides and then with epichlorohydrin. In either case, the resulting brightening agents are characterized by attachment to adjacent carbon atoms of the alkanoxy group of a sulfonic and an hydroxyl radical. Plating bath solutions incorporating the novel addition agents, and plating processes employing such solutions are also enclosed.

3,699,017

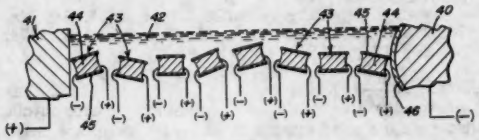
POLAR ACTIVATING PARTICLES FOR ELECTRODEPOSITION PROCESS

Steve Eisner, Schenectady, N.Y., assignor to Norton Company, Troy, N.Y.

Filed May 27, 1971, Ser. No. 147,409

Int. Cl. C23b *5/48, 5/18, 5/08*

U.S. Cl. 204—49 1 Claim



An electrically-conductive mass in the form of a small particle encapsulated in a hard non-conductive outer sheath having at least one opening in such sheath permitting contact between such conductive mass and a liquid electrolyte when the particle is immersed in such electrolyte. Preferably, the conductive mass and/or the outer sheath is so formed or treated that the conductive mass does not protrude beyond the sheath at any of said openings.

3,699,018

METHOD OF ELECTRODEPOSITING CORAL COPPER ON COPPER FOIL

Clarence A. Carlson, West Salem, Wis., assignor to Northern Engraving Company

No Drawing. Filed July 12, 1971, Ser. No. 162,004

Int. Cl. C23b *5/20, 5/50*

U.S. Cl. 204—52 R 3 Claims

A process for electrodepositing coral copper on copper foil which uses a plating bath which consists essentially of copper sulfamate, sulfamic acid, sodium dihexyl sulfosuccinate and water. Utilizing this plating bath with little, if any, agitation and current densities between 75 and 140 amperes per square foot, coral, or nodularized copper can be deposited upon the copper foil.

3,699,019

ELECTROLYTE FOR SELF-COLORED ANODIZATION OF ALUMINUM AND ALLOYS

Richaud Henri, Le Mans, and Michel Roussos, Lyon, France, assignors to Compagnie Pechiney, Paris, France

No Drawing. Original application Feb. 10, 1969, Ser. No. 798,122, now Patent No. 3,565,772. Divided and this application Oct. 19, 1970, Ser. No. 82,223

Int. Cl. C23b *9/02*

U.S. Cl. 204—58 3 Claims

The self-colored anodization of aluminum and alloys of aluminum by use of an aqueous electrolyte containing sulphomaleic acid dissolved therein alone or in combination with sulphuric acid.

3,699,020

ELECTROCHEMICAL PRODUCTION OF 1,4-DIHYDRO AROMATIC COMPOUNDS

John F. Connolly, Chicago, and Robert J. Flannery, Olympia Fields, Ill., and John D. McCollum, Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,466

Int. Cl. C07b *1/00, 29/06*

U.S. Cl. 204—73 26 Claims

Aromatic hydrocarbon compounds are selectively reduced electrochemically to their 1,4-dihydro derivatives in an ammoniated solvent-electrolyte system under conditions selected to effect oxidation of ammonia.

3,699,021

FULMINATING MATERIAL APPLICATION TECHNIQUE

John W. Shaffer, Williamsport, and Thomas B. McDonough, Allenwood, Pa., assignors to Sylvania Electric Products Inc.

Filed Dec. 17, 1970, Ser. No. 99,117

Int. Cl. B01k *1/00*

U.S. Cl. 204—146 5 Claims

A method of providing the primer anvil wire of a percussive-type photoflash lamp with a charge of a fulminating material in which a coating of fulminating material is applied on the anvil wire extending along its length a predetermined distance from one end thereof, the coating is dried, and then the coated end of the wire is dipped a predetermined distance into an electrolytic solution containing a colloidal thixotropic agent. This last step electrochemically strips the coating from a segment of the wire extending from the coated end thereof to thereby provide an anvil wire having a coating of fulminating material disposed on a segment of predetermined length located intermediate the ends thereof.

3,699,022

PHOTOPOLYMERIZABLE UNSATURATED POLYESTERS CONTAINING BENZOIN-ETHER, ORGANIC ACID ESTER, ORGANIC PHOSPHINE INITIATORS

Burkhard Behrens and Hermann Delius, Ahrensburg, Germany, assignors to Reichhold-Albert Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,158
Claims priority, application Switzerland, Feb. 5, 1970, 1,626/70, 1,627/70; Jan. 5, 1971, 57/71, 58/71
Int. Cl. B01j 1/00; C08d 1/00
U.S. Cl. 204—159.15 20 Claims

This invention relates to preparations curable by UV irradiation, such as moulding, impregnating and coating compositions, of mixtures, stabilised in the usual manner, of unsaturated polyester resins and copolymerisable, monomeric compounds and photo-initiators, which optionally additionally contain polymerisation initiators and/or metal accelerators and/or paraffin or wax or wax-like substances, characterised in that they contain, as the photo-initiator, an overall combination consisting of:

(a) benzoin-ethers, and
(b) a sub-combination of at least two different compounds of trivalent phosphorus, consisting of:
(b') organic ester of phosphorous acid of general formula

(I)

wherein R_1, R_2 and R_3 can be identical or different and represent aliphatic, cycloaliphatic, aromatic, araliphatic or heterocyclic radicals—but one of the radials R_1, R_2 or R_3 must always be an aromatic radical—and
(b'') of organic derivatives of phosphine of general formula

(II)

wherein R_1, R_2 and R_3 can be identical or different and represent aliphatic, cycloaliphatic, aromatic, araliphatic or heterocyclic radicals—but one of the radials R_1, R_2 or R_3 must always be an aromatic radical—and the percentages by weight mentioned relate to the total weight of unsaturated polyester resin and copolymerisable monomers.

The invention relates also to a process for the preparation of shaped articles, impregnations, coatings and the like, from said preparations curable by UV irradiation, such as moulding, impregnating and coating compositions, of mixtures, stablised in the usual manner, of unsaturated polyester resins and copolymerisable, monomeric compounds and photo-initiators, which optionally additionally contain polymerisation initiators and/or metal accelerators and/or paraffin or wax or wax-like substances, characterised in that, as the photo-initiator, the said overall combination is used.

3,699,023

METHOD FOR MAKING HIGH TEMPERATURE INSULATING COMPOSITIONS AND SAID COMPOSITIONS

George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 340,796, Jan. 28, 1964. This application May 14, 1968, Ser. No. 729,129
Int. Cl. C08d 1/00; C08f 1/00
U.S. Cl. 204—159.19 6 Claims

A method for preparing a high temperature insulator comprising the steps of preparing a reaction mixture of a polyester polyol, an organo-peroxide, an organic polyisocyanate and a filler having a resistance to burning; and setting and curing the reaction mixture at a temperature no greater than about 250° F. for about 10 to 20 hours followed by subjecting the cured reaction mixture to a treatment of at least 300° F. for at least 10 hours or an ionizing radiation treatment of about 5 to about 30 megarads.

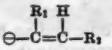
3,699,024

RADIATION POLYMERIZATION OF VINYL CARBORANES AND NOVEL PRODUCTS RESULTING THEREFROM

Theodore J. Klingen, Oxford, Miss., and John R. Wright, Batesville, Ark., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 29, 1970, Ser. No. 85,003
Int. Cl. C08f 1/16, 1/24
U.S. Cl. 204—159.22 2 Claims

This invention relates to a method for forming an addition polymer from a vinyl carborane monomer which comprises irradiating said monomer with high-energy radiation in an oxygen-free atmosphere to a dose which will effect conversion of the monomer to a desired polymer, said monomer being selected from those described by the generic formula



where ⊖ is the carborane cage structure wherein the vinyl group is attached to one of the carbons in the carborane cage, R_1 is H or CH_3, and R_2 is H or an alkyl group, and to the polymers resulting therefrom.

3,699,025

PROCESS FOR RADIATION CROSS-LINKING UTILIZING N-HETEROCYCLIC COMPOUNDS WITH CLEAVABLE OXY SUBSTITUENTS

Philip W. Jenkins, Donald W. Heseltine, and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Oct. 9, 1968, Ser. No. 766,288. Divided and this application Mar. 18, 1971, Ser. No. 125,834
Int. Cl. C08d 1/00; G03c 1/68
U.S. Cl. 204—159.14 11 Claims

Energy-sensitive compounds containing a heterocyclic nitrogen atom substituted with an —OR group are cross-linking agents for polymers having hardenable groups.

3,699,026

PHOTOPOLYMERIZATION USING N-ALKOXY HETEROCYCLIC INITIATORS

Philip W. Jenkins, Donald W. Heseltine, and John D. Mee, all % Eastman Kodak Company, Rochester, N.Y. 14650

No Drawing. Original application Oct. 9, 1968, Ser. No. 766,304, now Patent No. 3,574,622. Divided and this application July 27, 1970, Ser. No. 64,888
Int. Cl. C08d 1/00; G03c 1/70
U.S. Cl. 204—159.23 12 Claims

Energy-sensitive compounds containing a heterocyclic nitrogen atom substituted with an —OR group are photochemical initiators for the polymerization of vinyl monomers.

3,699,027

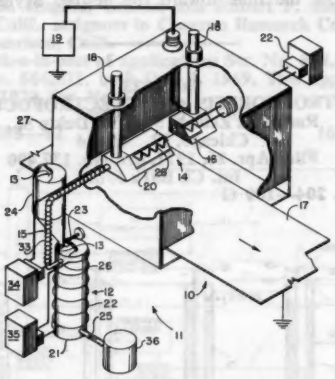
DEPOSITION METHOD

Emery P. Miller, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed Feb. 2, 1970, Ser. No. 7,589
Int. Cl. C23d 11/08; B32b 17/06
U.S. Cl. 204—164 22 Claims

A method for producing a metal containing deposit upon a surface of a substrate. The method includes the

steps of vaporizing a matter such as water or an organometallic compound and electrostatically charging the vapors of the matter. The surface of the substrate upon which the vapors of the matter are deposited is caused to acquire an electrostatic potential which attracts and causes the electrostatically charged vapors of the matter to be deposited thereon. Prior to the deposition of the



electrostatically charged vapors of the organometallic compound upon the surface of the substrate, the surface may be heated to an elevated temperature sufficient to cause the organometallic compound vapors to decompose upon contact with the heated surface of the substrate to produce a metal containing deposit upon such surface.

An article provided by the method.

3,699,028

NON-WOVEN FABRICS BY ELECTRODEPOSITION

Robert Edward Torley, Wilton, and Richard Dale Bankert, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,875
Int. Cl. B01d *13/02*; B01k *5/00*; C23b *7/00*
U.S. Cl. 204—180 R **8 Claims**

Non-woven fabric webs of fiber and binder resin are formed at one electrode of an electrolytic cell from a dilute bath of fibers and resin in aqueous suspension. Soft, pliable webs are obtained by using very dilute suspensions having less than one percent by wt. fiber and less than 0.2 percent by wt. resin in the aqueous coating bath and having one to five parts fiber per one part resin in said bath.

3,699,029

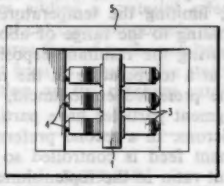
ANTICORROSIVE ELECTROPHORETIC COATING PROCESS

Harry F. Bell, 20 Sabra Lane, Wappingers Falls, N.Y. 12590; Donald J. Lazzarini, 909 Murray Hill Road, Binghamton, N.Y. 13903; and Lewis K. Schultz, 11 Brown Lane, Apalachin, N.Y. 13732

Filed Aug. 19, 1970, Ser. No. 65,045
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **9 Claims**

Anticorrosive coatings are selectively, electrophoretically deposited on substrates, including electronic components.

The process comprises forming a polyvinylidene-chloride-epoxy ester resin polymer suspension in water, and selectively, electrophoretically depositing the polymeric components of the suspension onto the desired portions of the electronic components. Benzotriazole is a preferred additive to inhibit corrosion. By selection of the electrophoretic deposition voltage, metal portions of the component having a formal oxidation potential below the coating voltage will have the polymer blend deposited thereon, whereas metal portions having a formal oxidation potential above the coating voltage will remain uncoated.

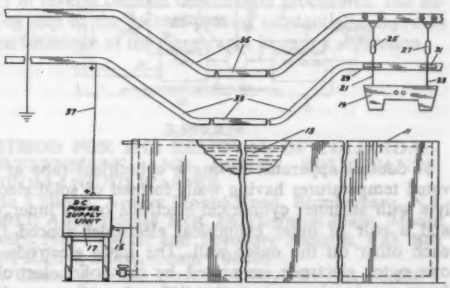


3,699,030

PROCESS FOR ELECTRODEPOSITING PAINT

Allan E. Gilchrist, Westlake, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 518,620, Jan. 4, 1966, now Patent No. 3,532,613, which is a continuation-in-part of application Ser. No. 375,633, June 16, 1964, now abandoned, which is a continuation-in-part of applications Ser. No. 304,297, Aug. 14, 1963, now Patent No. 3,230,162 and Ser. No. 273,270, Apr. 16, 1963, now abandoned. Said application Ser. No. 304,297 is a continuation-in-part of application Ser. No. 249,812, Jan. 7, 1963, now abandoned, which is a continuation-in-part of application Ser. No. 186,320, Apr. 10, 1962, now Patent No. 3,351,575, and applications Ser. No. 132,303, Aug. 18, 1961, Ser. No. 183,024, Mar. 28, 1962, Ser. No. 186,496, Apr. 10 1962 Ser. No. 202,691, June 15, 1962, and Ser. No. 218,575, Aug. 22, 1962, all abandoned. Said application Ser. No. 273,270 is a continuation-in-part of said applications Ser. No. 249,812 and Ser. No. 258,913, Feb. 15, 1963, now abandoned, which in turn is a continuation-in-part of said applications Ser. No. 249,812, Ser. No. 186,320, Ser. No. 132,303, Ser. No. 183,024, Ser. No. 186,496, Ser. No. 202,691, and Ser. No. 218,575. This application Dec. 18, 1969, Ser. No. 886,278
The portion of the term of the patent subsequent to Jan. 9, 1985, has been disclaimed
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **4 Claims**



An improved process for anodic electrodeposition of paint comprises in combination the steps of limiting the infusible, particulate pigment used in the replenishment feed to an average particle size limit not substantially in excess of 2 microns, replenishing the bath at a rate that

limits the concentration of paint solids in the coating bath to the range of about 5 to about 15 weight percent thereof, limiting the immersion of the workpiece to a time in the range of about 1 to about 3 minutes while coating current is being passed through the bath and between the workpiece anode and a cathode in contact with the bath, limiting the temperature of the coating bath during coating to the range of about 20° to about 35° C., and curing the resultant deposit of paint upon the workpiece at a temperature in the range of 120° to 200° C. In one preferred embodiment, at least 95 percent of the pigment particles have particle size limit of less than 2 microns. In a second preferred embodiment, the replenishment feed is controlled so that the binder resin to pigment ratio in the replenishment feed is lower than the corresponding ratio existing in the bath being replenished.

3,699,031
ELECTROCOATING PROCESS

Brian Alfred Cooke, Knotty Green, and James Arthur Magee, Marlow Bottom, England, assignors to Imperial Chemical Industries Limited, London, England

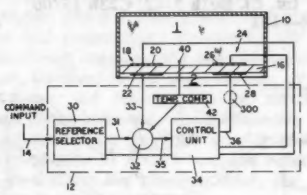
No Drawing. Filed May 19, 1970, Ser. No. 38,895
Claims priority, application Great Britain, May 23, 1969, 26,428/69
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—181 **12 Claims**

In a process of coating an electrically conductive article by electrodeposition from a dispersion of film-forming material, the coating of a surface of the article relatively inaccessible to the counter-electrode is improved by joining the adjacent region of dispersion through an ion-conducting bridge with a more accessible region. The bridge may comprise an electrolyte within a casing which is permeable to the counter-ion.

3,699,032
DEVICES FOR THE CONTROL OF AGENTS IN FLUIDS

Robert Anthony Rapp, Westerville, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed June 20, 1969, Ser. No. 835,191
Int. Cl. B01k *3/00*
U.S. Cl. 204—195 S **1 Claim**

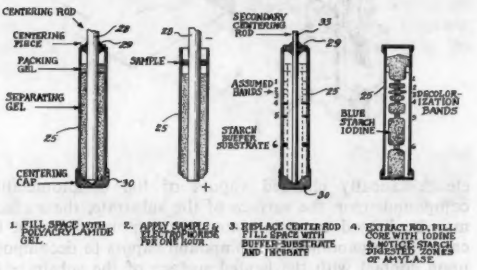


A control apparatus having a cylindrical tube at elevated temperatures having walls formed of solid electrolyte with an inner cylindrical electrode on its inner wall and a pair of outer cylindrical electrodes spaced from each other on the outer wall. The inner electrode and one outer electrode, separated by the solid electrolyte, form a galvanic measuring cell for providing a voltage proportional to the natural logarithm of the ratio of the oxygen partial pressure within the tube and the oxygen partial pressure outside of the tube. The other outer electrode, together with the inner electrode and the interposed solid electrolyte, form a pumping cell on which a voltage is impressed to cause transport of oxygen through the pumping cell by coulometric titration. This movement of oxygen effects changes in the oxygen partial pressure either inside or outside the tube as desired. A control system is electrically connected to both of the cells and has a command input for selecting the desired oxygen partial pressure for the chamber in which the oxygen activity is to be controlled. The control system provides a voltage on the pumping cell which is derived from the command input and the measuring cell voltage in order to bring the oxygen partial pressure either within or without the tube toward the desired oxygen partial pressure.

3,699,033
ELECTROPHORESIS AND ELECTROFOCUSING

Rashid A. Zeineh, 5742 W. Dakin St., Chicago, Ill. 60634

Filed Apr. 26, 1971, Ser. No. 137,490
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G **4 Claims**

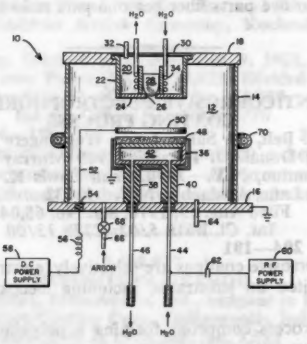

CENTERING ROD
CENTERING PIECE
PACKING GEL
SEPARATING GEL
CENTERING CAP
SAMPLE
SECONDARY CENTERING ROD
ASSUMED BANDS
STARCH BUFFER SUBSTRATE
DECOLORIZATION BANDS
BLUE STARCH IODINE
1. FILL SPACE WITH POLYACRYLAMIDE GEL.
2. APPLY SAMPLE & ELECTROPHORESE FOR ONE HOUR.
3. REPLACE CENTER ROD FILL SPACE WITH BUFFER-SUBSTRATE AND INCUBATE
4. EXTRACT ROD, FILL CORE WITH IODINE & NOTICE STARCH DIGESTED ZONES OF AMYLASE.

A method and apparatus for electrophoretic and electrofocusing analysis. Tubes with gel around an internal core rod or rods enable analysis of samples which are electrophoresed within the tube without removing the gel and sample from the tube.

3,699,034
METHOD FOR SPUTTER DEPOSITING DIELECTRIC MATERIALS

Stanley J. Lins, Minneapolis, and Charles J. Nelson, Rosemount, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 15, 1971, Ser. No. 124,093
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **3 Claims**



A method for preparing a substrate for the subsequent receipt of a dielectric coating wherein the substrate to be coated is first subjected to bombardment of positive ions

which cause impurities on the substrate to be dislodged, and attracted to a shutter member. After the substrate has been cleaned in this fashion, the shutter member is removed and the direction of ion travel is reversed causing the dielectric material to be sputtered onto the substrate.

3,699,035

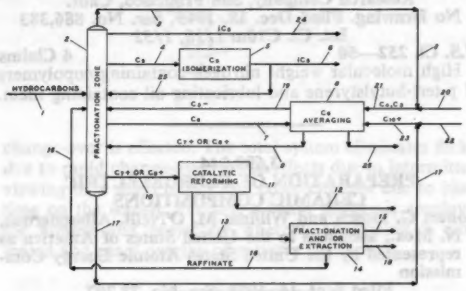
PRODUCTION OF GASOLINE BY AVERAGING AND REFORMING

Thomas R. Hughes, Orinda, and Robert P. Sieg, Piedmont, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of applications Ser. No. 864,870 and Ser. No. 864,871, both Oct. 8, 1969. This application July 1, 1970, Ser. No. 51,459

Int. Cl. C10g *39/00*

U.S. Cl. 208—92 **10 Claims**



A process for producing gasoline from a hexane-rich hydrocarbon feed which comprises averaging hexane with one or more alkanes selected from the group consisting of propane or butanes or C_{10}^+ hydrocarbons or mixtures of the foregoing hydrocarbons to obtain at least C_7^+ hydrocarbons, and catalytically reforming the C_7^+ hydrocarbons to obtain reformate. Preferably at least a portion of the hydrocarbons averaged with the hexane is raffinate derived from extraction following the catalytic reforming step. Preferably, a portion of the n-pentane produced in hexane averaging is isomerized to isopentane.

3,699,036

HYDROCRACKING NITROGEN CONTAINING FEEDSTOCKS

Robert H. Hass, Fullerton, and Cloyd P. Reeg, Orange, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,062

Int. Cl. C10g *13/02, 13/04, 13/10*

U.S. Cl. 208—111 **14 Claims**

Hydrocarbons containing substantial amounts of organo-nitrogen compounds are converted in the presence of hydrogen over a catalyst comprising alumina, aluminosilicates, or combinations thereof with silica, zirconia, magnesia and the like with or without active metal components in the presence of controlled minor amounts of added water.

3,699,037

CATALYTIC CRACKING

Richard J. Annesser and Stephen A. Balogh, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing Filed Oct. 28, 1970, Ser. No. 85,836

Int. Cl. B01j *11/68;* C01b *17/56;* C01g *11/02*

U.S. Cl. 208—120 **9 Claims**

A process for reducing the SO_2 emission from a catalytic cracking unit wherein a hydrocarbon feedstock containing organic sulfur compounds is fed to a reaction zone and contacted with cracking catalyst at a temperature in the reaction zone between 750 and 1150° F. and the cracking catalyst is then regenerated in a regeneration zone by burning coke off the cracking catalyst at a temperature between 800–1300° F. and the regenerated cracking catalyst is recycled to the reaction zone, which process comprises adding a material selected from the group consisting of calcium compounds, magnesium compounds and mixtures thereof to the catalytic cracking unit cycle at a rate at least as large as the stoichiometric rate of sulfur deposition on the cracking catalyst in the reaction zone.

3,699,038

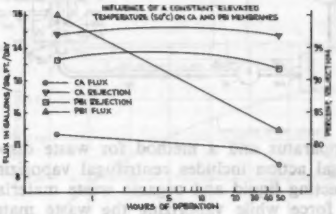
PRODUCTION OF IMPROVED SEMIPERMEABLE POLYBENZIMIDAZOLE MEMBRANES

Abraham A. Boom, Martinsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,846

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **21 Claims**



A process is provided for producing improved semipermeable membranes which find particular utility in the separation of components of a solution. A solution of a polybenzimidazole polymer is deposited upon a support to form a wet film, an amount of solvent is evaporated from the wet film sufficient to allow the formation of a thin layer of higher density at the exposed surface of the film, the resulting film is washed with a non-solvent for the polybenzimidazole polymer to remove residual solvent thereby forming a semipermeable polybenzimidazole membrane, and the resulting membrane is annealed by contact with an organic liquid under conditions found capable of substantially enhancing the properties of the same.

The polybenzimidazole membranes find particular utility in reverse osmosis desalination procedures. The annealing step of the present process substantially improves the performance of the membranes in such a separation.

3,699,039

METHOD FOR THE REMOVAL OF COLLOIDAL SUSPENSIONS AND OTHER POLLUTANTS FROM LIQUID WASTES

Calvin Calmon, Arneys Mount Road, Birmingham, N.J. 08011; Allyn Harold Heit, 14 Thornton Place, Mount Holly, N.J. 08011; and Theodore Helfgott, P.O. Box 129, R.D. 2, Storrs, Conn. 06268

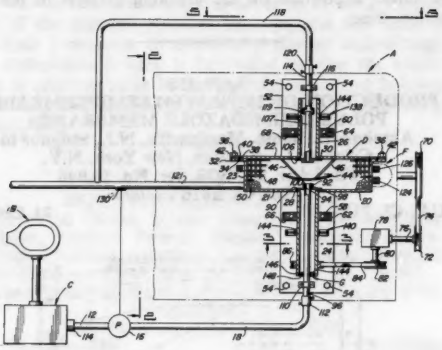
No Drawing. Filed Nov. 2, 1970, Ser. No. 86,286

Int. Cl. C02b *1/14*

U.S. Cl. 210—28 **5 Claims**

The treatment of waste products polluted with anionic surfactants and other colloidal suspensions with abietic acid amines and derivatives thereof and subsequent filtration by short surging cycles through a compressible absorption filter medium having absorbent and or ion exchange properties.

3,699,040
METHOD FOR WASTE DISPOSAL WITH CENTRIFUGAL ACTION
James S. Reid, Hudson, Ohio, assignor to Thermason Corporation, Ann Arbor, Mich.
Continuation-in-part of application Ser. No. 81,813, Oct. 19, 1970. This application Apr. 21, 1971, Ser. No. 135,850
Int. Cl. B01d *15/06, 33/16, 35/18*
U.S. Cl. 210—32 11 Claims



An apparatus and a method for waste disposal with centrifugal action includes centrifugal vaporizing means for subjecting liquid and organic waste material to centrifugal force while vaporizing the waste material. Organic material is forced below the surface of the liquid waste material by centrifugal force. The vaporizing means is heated while centrifugal force is acting on the waste material so that substantially pure liquid is turned into vapor and substantially no organic material is carried from the vaporizing means with the vapor.

3,699,041
SURFACE MODIFIED ALUMINA HYDRATE FILLER
Freeman M. Sanderford, Dalton, Ga., and Jack C. Ray, Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
No Drawing. Filed June 4, 1971, Ser. No. 150,217
Int. Cl. C09k *3/28*; C09d *5/18*
U.S. Cl. 252—8.1 15 Claims

Surface modified alumina hydrate compositions are provided which are compatible with latex compositions when utilized as flame-retardant fillers. The surface modification is accomplished by treating alumina hydrate with a small but effective quantity of a surfactant comprising a mixture of ethoxylated fatty acid amides with an amino alcohol. The surface modifier alumina hydrate, even in significant quantities, is particularly suitable as filler for latex foam compositions.

3,699,042
DRILLING FLUID COMPOSITION AND PROCESS FOR DRILLING SUBTERRANEAN WELLS
William C. Browning and Billy G. Chesser, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.
Continuation-in-part of application Ser. No. 47,325, June 18, 1970. This application Nov. 16, 1970, Ser. No. 89,626
Int. Cl. C10m *3/48*
U.S. Cl. 252—8.5 C 5 Claims

The present invention relates to a novel drilling fluid composition consisting essentially of (1) a macromolecular polysaccharide aqueous solution, and (2) a metal ion buffered cross-linking agent for said solution consisting essentially of (a) an organic polyelectrolyte ligand component, and (b) a metal component of the first series of the transition elements of the Periodic Table. This drilling fluid has been found to provide enhanced rheological properties without obtaining metal ion overtreatment characteristics. In a preferred form, said drilling fluid has a metal ion buffered cross-linking agent additionally containing a compound of a metal from Group II of the Periodic Table. A process for drilling a subterranean well with the present drilling fluid composition is also incorporated.

3,699,043
NITROGEN-CONTAINING p - TERT-BUTYLSTYRENE COPOLYMERS IN LUBRICANT COMPOSITIONS
Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Dec. 18, 1969, Ser. No. 886,383
Int. Cl. C10m *1/28, 1/32*
U.S. Cl. 252—50 4 Claims

High molecular weight nitrogen-containing copolymers of p-tert-butylstyrene and lubricating oil containing them.

3,699,044
PREPARATION OF FERROELECTRIC CERAMIC COMPOSITIONS
Robert G. Dosch and William M. O'Neill, Albuquerque, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Sept. 16, 1970, Ser. No. 72,707
Int. Cl. C04b *35/00, 33/00*
U.S. Cl. 252—62.9 2 Claims

Preparation of ferroelectric ceramic, refractory oxide, compositions by mixing a metal alkoxide with a quaternary ammonium hydroxide to obtain a solution containing a soluble metal complex ion, thereafter mixing a metal salt with said solution to form a precipitate, filtering the precipitate and calcining the precipitate to said refractory oxide composition.

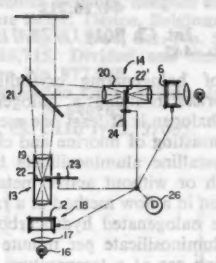
3,699,045
PIEZOELECTRIC CERAMIC-MATERIAL
Norio Tsubouchi, Masao Takahashi, Tomeji Ohno, and Tsuneo Akashi, Tokyo-to, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan
Filed Dec. 22, 1967, Ser. No. 692,739
Claims priority, application Japan, Dec. 29, 1966, 42/971, 42/972, 42/974, 42/21,108, 42/25,273, 42/25,274, 42/49,623, 42/56,175
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 5 Claims

A piezoelectric ceramic material is provided consisting essentially of a solid solution of the three components $Pb(Mn_{1/3}Z_{2/3})O_3$, $PbTiO_3$ and $PbZrO_3$, wherein Z represents one element selected from the group consisting of Nb, Ta, Sb and Bi.

3,699,046
MOTION PICTURE SYSTEM
Guiseppe Midulla, Tampa, Fla., assignor to Howard L. Rose, Potomac, Md., Elmer Moon, Atlanta, Ga., Roger Early, Brandon, Fla., and William C. Rubelsky, Ronald Leacock, William P. Rubelsky, Frank Perez, Jr., Arthur S. Gibbons, and Carlos B. McDaniel, all of Tampa, Fla., fractional part interest to each
Filed Sept. 4, 1968, Ser. No. 757,423
Int. Cl. G03b *21/40*
U.S. Cl. 352—68 6 Claims

A motion picture taking and projection system employs two cameras and two projectors. The two cameras take pictures sequentially and successively in alternation with

one camera taking a picture at all times. In the projection system the projectors operate sequentially and successively in alternation so that a projector is projecting an image on the screen at all times. The shutters, particularly of the projectors, are operative at the focal plane of the lens system of the projectors so that very rapid picture



change-over is effected. The total system eliminates flicker due to rapid change-over strobe effects due to intermittent viewing of a main object and color changes due to black time on the screen. Further, a beam splitter is employed for filming and projecting whereby keystoning is eliminated and exact overlay of pictures is effected.

3,699,047

COOLANT SYSTEM AND CORROSION INHIBITOR AND METHOD OF USE

Ernest Q. Petrey, Jr., Randolph Township, N.J., assignor to Drew Chemical Corporation, New York, N.Y.

No Drawing. Filed May 13, 1970, Ser. No. 37,012
Int. Cl. C23f *11/10, 11/16*
U.S. Cl. 252—175 **14 Claims**

A cooling system corrosion inhibitor which comprises a divalent metal ion, a chelating agent, and a modified lignosulfonate polymeric material, and the process of utilizing said corrosion inhibitor.

3,699,048

PROCESS OF PREVENTING SCALE AND DEPOSIT FORMATION IN AQUEOUS SYSTEMS AND PRODUCT

Friedrich Krueger, Edingen, and Lieselotte Bauer, Bad Duerkheim, Germany, assignors to Joh. A. Benckiser GmbH Chemische Fabrik, Ludwigshafen am Rhine, Germany

No Drawing. Filed July 21, 1970, Ser. No. 56,982
Claims priority, application Germany, July 24, 1969, P 19 37 575.8
Int. Cl. C02b *5/06*; C23f *14/02*
U.S. Cl. 252—180 **35 Claims**

Formation of scale and incrustation in aqueous systems is prevented by the addition of a mixture composed of

(a) an amino alkylene phosphonic acid and of

(b) an acrylic or methacrylic acid polymer or a copolymer of acrylic acid and methacrylic acid, or a copolymer of acrylic acid and/or methacrylic acid with a polymerizable, ethylenically unsaturated compound, or a graft polymer of a polysaccharide and especially of starch, dextrin, and modified starch with said acrylic and/or methacrylic acid polymers and copolymers,

preferably in substoichiometric amounts calculated for the scale and hardness causing compounds present in the aqueous system.

3,699,049

PROCESS FOR MAKING SILICA ORGANOSOLS

Linda J. Pluta, North Riverside, and Peter H. Vossos, Lisle, Ill., assignors to Nalco Chemical Corporation, Chicago, Ill.

No Drawing. Filed Feb. 4, 1971, Ser. No. 112,814
Int. Cl. B01j *13/00*
U.S. Cl. 252—309 **9 Claims**

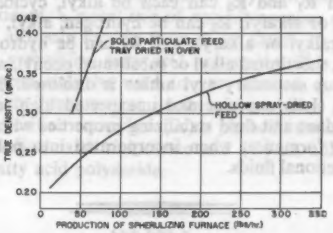
A process for making silica organosol compositions comprising from 5 to 50% by weight of silica particles as SiO_2 and from 50 to 95% of a water miscible polyhydric alcohol is disclosed. Preferably, the water miscible polyhydric alcohol is glycerol.

3,699,050

SPRAY DRIED PRODUCT FOR FEED IN THE MANUFACTURE OF HOLLOW GLASS SPHERES AND PROCESS FOR FORMING SAID SPRAY DRIED PRODUCT

Craig Henderson, Clarkson, Ontario, Canada, assignor to Emerson & Cuming, Inc., Canton, Mass.

Filed Aug. 2, 1967, Ser. No. 657,865
Int. Cl. B01j *13/00*
U.S. Cl. 252—317 **6 Claims**



The instant application relates to a product formed by the spray drying of an alkali borosilicate sol, which product is subsequently utilized as feed to a spherulizing furnace which produces hollow glass spheres of a diameter in a range from about 5 to 5000 microns.

3,699,051

COMPOSITIONS AND PROCESSES FOR BREAKING PETROLEUM EMULSIONS

Ronald G. Sampson, Huntington Beach, Calif., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 53,709, July 9, 1970. This application Aug. 27, 1970, Ser. No. 67,559
Int. Cl. B01d *17/04*
U.S. Cl. 252—344 **11 Claims**

Compositions of matter and a process for breaking water-in-oil petroleum emulsions therewith, which compositions comprise a substantially water-insoluble at least partially oil-soluble product formed by the combination of (a) a diisocyanate and a polyoxyalkylated compound and (b) polyoxyalkylated alkyl phenolformaldehyde polycondensates is disclosed.

3,699,052

CORROSION INHIBITOR COMPOSITION CONTAINING A GLYCINE, CHELATING AGENT, PHOSPHORIC OR BORIC ACID ESTER, AND A WATER SOLUBLE DIVALENT METAL SALT

Ernest Quentin Petrey, Jr., Randolph Township, and Ronald M. Werner, West Paterson, N.J., assignors to Drew Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,080
Int. Cl. C23f *11/14, 11/16*
U.S. Cl. 252—389 **34 Claims**

A multi-functional corrosion inhibitor which comprises a divalent metal ion, chelating agent, a trivalent

inorganic acid ester, and an amino acid or a derivative thereof, and the process of utilizing said corrosion inhibitor in a multitude of non-related applications.

3,699,053

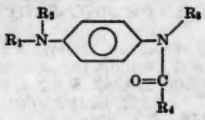
FUNCTIONAL FLUID ANTIOXIDANTS

William F. Gentit, Mohegan Lake, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,613
Int. Cl. C09k 3/02
U.S. Cl. 252—403 8 Claims

An antioxidant composition comprising a mixture of:

(A) A monoacylated phenylene diamine of the formula



wherein R_1 and R_3 can each be alkyl, cycloalkyl, aryl, aralkyl or alkaryl; R_2 can be hydrogen, alkyl, cycloalkyl, aryl, aralkyl or alkaryl; and R_4 can be hydrogen, alkyl, phenyl, substituted alkyl or substituted phenyl, and

(B) A secondary aryl amine is disclosed. These compounds show superior and unexpected high temperature antioxidant and fluid stabilizing properties with very little deposit formation when incorporated into polycarboxylate functional fluids.

3,699,054

COPPER CHROMITE HYDROGENATION CATALYST REGENERATION PROCESS

Glenn E. Organ, Bay City, and Ronald H. Wile, Kingsville, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 827,935, May 26, 1969. This application Apr. 29, 1971, Ser. No. 138,792
Int. Cl. B01j 11/02, 11/04, 11/68
U.S. Cl. 252—414 15 Claims

A spent copper chromite hydrogenation catalyst is restored to a catalytically active condition by a process which comprises (a) washing organic materials therefrom with a volatile solvent, (b) drying the washed catalyst to remove the volatile solvent therefrom, and (c) heating the washed, dried catalyst in an atmosphere comprising molecular oxygen at a controlled temperature.

3,699,055

TRIARYLPHOSPHINE, ALKYLLITHIUM, AND 1,3-DIHALOBENZENE POLYMERIZATION INITIATOR FOR CONJUGATED DIENE POLYMERIZATION

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Original application Mar. 6, 1970, Ser. No. 17,310, now Patent No. 3,631,015. Divided and this application July 19, 1971, Ser. No. 164,097
Int. Cl. C08d 3/04; C08p 3/16
U.S. Cl. 252—431 P 8 Claims

A method of manufacturing high cis-polydienes by polymerizing a conjugated diene with an initiator prepared by reacting a triarylphosphine, an alkyllithium and a 1,3-di-halobenzene.

3,699,056

METHOD OF HALOGENATING CRYSTALLINE ALUMINOSILICATE

Shinji Takase and Tomonori Shiori, Kawasaki, Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Filed Mar. 5, 1970, Ser. No. 16,880
Claims priority, application Japan, Mar. 5, 1969, 44/16,212
Int. Cl. B01j 11/78, 11/40
U.S. Cl. 252—442 1 Claim

Method of halogenating crystalline aluminosilicate which comprises bringing a halogenated hydrocarbon wherein the halogen is at least one member selected from the group consisting of fluorine and chlorine into contact with the crystalline aluminosilicate having openings of 6–15 A. with or without active metal components supported thereon in a flow method at a ratio of 1–1000 $cm.^3$ (stp.) of the halogenated hydrocarbon per gram of the crystalline aluminosilicate per minute in the presence of a non-reducing gas at a temperature of 160–350° C. to a halogen content of 0.01–20% by weight.

3,699,057

LUBRICATION

John J. Halko, Sr., and Andrew R. Halko, Washington Park, Del. (both % Freeland Chemical Co., 1605 McArthur Road, New Castle County Air Base, Del.)

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,225
Int. Cl. C10m 3/22, 3/04
U.S. Cl. 252—49.3 7 Claims

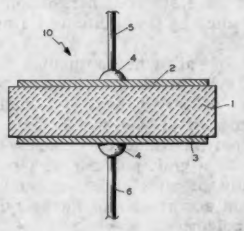
Aqueous solution of poly(ethylene oxide) of molecular weight 1,000,000 to 5,000,000 makes very effective lubricant for rubber, particularly for mounting rubber tires on drop-center metal wheels. Adding to the solution N,N-diethanol coconut fatty acid amide and N,N-diethanol-amine salt of long chain fatty acid, improves it and also inhibits rusting of wheels made of ferrous metal. Isopropanol can also be present in solution and stabilizes the poly(ethylene oxide).

3,699,058

URANIUM-MODIFIED ZINC OXIDE VOLTAGE VARIABLE RESISTOR

Michio Matsuoka, Takeshi Masuyama, and Yoshio Iida, Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1969, Ser. No. 866,820
Claims priority, application Japan, Oct. 22, 1968, 43/77,733
Int. Cl. H01b 1/06
U.S. Cl. 252—518 6 Claims



A voltage variable resistor ceramic composition consisting essentially of zinc oxide and, as an additive, uranium

oxide. The uranium-modified zinc oxide voltage variable resistor has improved voltage nonlinear properties due to the further addition of bismuth oxide, calcium oxide and cobalt oxide.

3,699,059

UNSATURATED CARBOXYLIC SALT MATERIALS AND DERIVATIVES THEREOF

Fred Smeets, Tienen, Belgium, assignor to N.V. La Citrique Belge, Tienen, Belgium

Original application July 8, 1966, Ser. No. 563,816, now Patent No. 3,586,715. Divided and this application Nov. 24, 1969, Ser. No. 877,589

Claims priority, application Great Britain, July 19, 1965, 30,640/65

Int. Cl. C11d *1/12, 3/065*

U.S. Cl. 252—557 7 Claims

A surface-active composition comprising a sulfonic acid ester of an unsaturated organic alkaline earth metal salt material is disclosed. The surface-active composition is produced by sulfonating a composition produced by heating an alkaline-earth metal salt of citric acid until not more than 32% by weight of the original acid salt remains and esterifying the reaction mixture with one or more monohydric alcohols of from 1 to 22 carbon atoms.

3,699,060

POLYURETHANE FOAMS PREPARED FROM OXYPROPYLATED AND HIGHER OXYALKYLATED STARCH-PHOSPHORUS-CONTAINING POLYETHERS

Stephen Fuzesi, Hamden, Conn., and Milton Lapkin, Barrington, R.I., assignors to Olin Corporation

No Drawing. Continuation-in-part of application Ser. No. 735,930, Feb. 20, 1968, which is a division of application Ser. No. 457,814, May 21, 1965. This application Oct. 5, 1970, Ser. No. 78,192

Int. Cl. C08g *22/14, 22/44*

U.S. Cl. 260—2.5 AR 7 Claims

Flame retardant polyurethane foams are prepared from a polyether polyol, an organic polyisocyanate, a foaming agent and a catalyst, wherein the polyether polyol is an oxyalkylated starch-phosphorus-containing polyether. The oxyalkylating compound contains at least three carbon atoms, such as propylene oxide.

3,699,061

COATING COMPOSITION CONTAINING URETHAN-MODIFIED EPOXIDIZED ESTER AND POLYCARBOXYLIC ACID MATERIAL

Arthur L. Cunningham, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,684

Int. Cl. C08g *45/12*

U.S. Cl. 260—18 PT 8 Claims

A resin suitable for making a two-package coating system includes a component vehicle comprising an epoxidized fatty acid ester partially reacted with a monocarboxylic alcohol and further reacted with a polyisocyanate to form a prepolymer material. In a two-package coating system, a polycarboxylic curing agent is admixed with the urethan-modified epoxidized ester for curing the resin by reaction of the carboxyl groups with residual oxirane groups. Hard tack-free films are achieved within a short period at ambient temperature. This resin is especially adapted for making protective and decorative coatings, either clear or pigmented.

3,699,062

STABILIZED OXYMETHYLENE POLYMERS

Leon Starr, Scotch Plains, N.J., and David Jon Runyon, Hoffman Estates, Ill., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 878,916, Nov. 21, 1969. This application July 7, 1971, Ser. No. 160,557

Int. Cl. C08g *51/54*

U.S. Cl. 260—18 N 12 Claims

Pigmented oxymethylene polymers are stabilized by a novel stabilizer which comprises an oxymethylene polymer antioxidant, a metal salt of non-nitrogenous organic acids and alcohols having from 2 to about 30 carbon atoms and a modified fatty acid polyamide. This unique stabilizer need only be used in very limited quantities to impart an improvement in thermal stability. A preferred composition comprises (A) a phenolic antioxidant, (B) an alkaline earth ricinoleate and (C) an anhydride modified fatty acid polyamide.

3,699,063

POLYURETHANE REACTION MIXTURE BASED ON ANHYDROUS DIAMINE-KETONE CURATIVE

Anthony S. Scheibelhoffer, Barberton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Application Aug. 22, 1969, Ser. No. 852,482, which is a division of application Ser. No. 612,347, Jan. 30, 1967. Divided and this application Jan. 14, 1971, Ser. No. 106,577

Int. Cl. C08g *22/16, 22/06*

U.S. Cl. 260—18 TN 10 Claims

A polyurethane reaction mixture comprising an isocyanate terminated polyurethane and a curative therefor prepared by treating a mixture of at least one diamine having amino groups attached to non-benzenoid carbon atoms and at least one liquid ketone with a drying agent non-reactive to diamines and ketones. The invention has particular utility for increasing the set-up time for such a reaction mixture through the special treatment of the curative, where such mixtures have heretofore had limited commercial potential because of their fast set-up times.

3,699,064

CARBOXYLIC CURING AGENT

Arthur L. Cunningham, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,183

Int. Cl. C08f *21/04*

U.S. Cl. 260—22 EP 10 Claims

A polycarboxylic curing agent soluble in paraffinic hydrocarbon solvents, particularly suitable as curing agents for epoxide resins, obtained by simultaneously reacting a polyol having from 3 to about 6 hydroxyl groups with a cyclic acid anhydride, and an olefin oxide with at least 10 serially linked carbon atoms having an oxirane functionality of from 1 to about 1.5.

3,699,065

WATER-SOLUBLE ALKYD RESIN COMPOSITIONS

Edgar L. Clark, Fredericksburg, Va., assignor to Commercial Solvent Corporation

No Drawing. Filed Mar. 4, 1971, Ser. No. 121,160
Int. Cl. C09d *3/64, 3/66, 5/24*
U.S. Cl. 260—22 R 10 Claims

A water-soluble alkyd resin composition and a 2-step process for the preparation thereof comprising the product of the reaction of an aliphatic monocarboxylic acid with di- or tripentaerythritol, which product is then reacted with phthalic anhydride to an acid number of 70–100, then neutralized. The composition is useful in the formulation of protective coatings, especially those intended for application by the electro-deposition process.

3,699,066

WATER-DISPERSED ANIONIC RESIN COMPOSITIONS STABILIZED AGAINST AGGLOMERATION

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to Commercial Solvents Corp.

No Drawing. Continuation-in-part of application Ser. No. 46,477, June 15, 1970. This application Oct. 8, 1971, Ser. No. 187,889
Int. Cl. C08g *17/16, 51/60*
U.S. Cl. 260—22 EP 3 Claims

A stabilizer for water-dispersible resin consisting of an alkanolamine dodecyl benzene sulfonate salt. The stabilizer provides a method of controlling relative concentrations of bath components during the electrodeposition process of coating articles with a resin.

3,699,067

ACRYLIC TERPOLYMER RESINS PLASTICIZED WITH SILICONE OILS

Charles H. Stockman, Middlesex County, Mass., assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,989
Int. Cl. C08f *45/50;* B44d *1/09*
U.S. Cl. 260—29.1 SB 1 Claim

Film forming acrylic resin terpolymers are found to be plasticized by the addition of silicone oils. Flexibility of the films and improvement thereof against cracking and blocking is achieved.

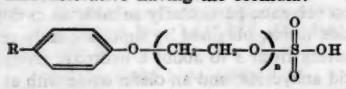
3,699,068

EMULSION POLYMERISATION OF VINYL CHLORIDE

John Anthony Flint and Graham John Blake, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,693
Claims priority, application Great Britain, Apr. 23, 1969, 20,804/69
Int. Cl. C08f *3/30*
U.S. Cl. 260—29.6 MQ 13 Claims

A process for the production of a stable aqueous vinyl chloride polymer emulsion suitable for conversion to fibers in which the polymerization is effected at a temperature below 0° C. in an aqueous medium, optionally containing at least one antifreeze, in the presence of an emulsifying agent comprising at least one soluble salt, for example an alkali metal or ammonium salt, of a sulfonic acid derivative of an alkyl phenoxy polyether alcohol, said derivative having the formula:



where R is an alkyl group of from 5 to 20 carbon atoms and *n* is a whole number of from 2 to 12.

3,699,069

COATING COMPOSITIONS AND COATED ARTICLES

Charles R. Peaker, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Aug. 13, 1969, Ser. No. 849,876
Int. Cl. C08d *7/10;* C08f *45/56, 45/60*
U.S. Cl. 260—29.7 SQ 14 Claims

Coating compositions for textiles, which compositions comprise a stabilized latex containing an alkyl sulfone or alkyl sulfoxide terminated oligomeric emulsifier.

3,699,070

EPOXY COMPOSITIONS FLEXIBILIZED WITH HYDROXYL-TERMINATED POLYMERS OF CYCLIC ESTERS

John Wynstra, Somerville, and John Joseph Stevens, Jr., Highland Park, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed July 17, 1969, Ser. No. 842,730
Int. Cl. C08g *51/34*
U.S. Cl. 260—31.4 EP 18 Claims

Curable compositions for insulating use, the cured products having a high degree of flexibility and superior weathering characteristics. These curable compositions comprise a polyepoxide, a curing agent therefor, and a hydroxyl-terminated polymer of a cyclic ester. The curable compositions may advantageously also contain a lactone to provide a higher degree of flexibility in the cured product.

3,699,071

HIGH MODULUS COMPOSITION COMPRISING HYDROCARBON OIL, RUBBER AND CARBON BLACK

Ivor W. Mills, Media, Glenn R. Dimeler, West Chester, and Merritt C. Kirk, Jr., Thornton, Pa., and Jackson S. Boyer, Claymont, Del., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Jan. 17, 1969, Ser. No. 792,131
Int. Cl. C08d *11/02;* C08k *1/22*
U.S. Cl. 260—33.6 AQ 6 Claims

A novel rubber vulcanizate comprises carbon black dispersed in rubber, such as butyl rubber, ethylene-propylene rubber, EPDM rubbers, or in mixtures of such rubbers, and as a plasticizer or extender, a petroleum hydrocarbon oil containing 45 to 85 weight percent aromatics and no more than 0.5 weight percent polar compounds. At a given level of cure, such a novel rubber composition has higher tensile strength and modulus than a similar composition wherein the hydrocarbon oil contains the same percentage of aromatics and a greater percentage of polar compounds.

3,699,072

SILICONE ELASTOMER WITH UNPRIMED ADHESION

William H. Clark, Mount Pleasant, and William R. Hays, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed June 24, 1971, Ser. No. 156,551
Int. Cl. C08g *51/04, 31/02*
U.S. Cl. 260—37 SB 11 Claims

A composition of a vinyldiorganosiloxy endblocked polydimethylsiloxane and a mixture of an organosiloxane having 5 to 20 silicon atoms per molecule and an average of at least three silicon-bonded hydrogen atoms per molecule and a modified organosiloxane having 6 to 21 silicon atoms per molecule, an average of at least two silicon-bonded hydrogen atoms per molecule and an average of at least one unit of $(RO)_3Si(CH_2)_x(CH_3)SiO$, $(RO)_3Si(CH_2)_x(CH_3)_2SiO_{0.5}$ and mixtures thereof where R is methyl, ethyl or

CH_3C-

and x is 2 or 3 is curable to an elastomer which has improved unprimed adhesion to substrates, particularly metal substrates.

3,699,073

ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Tadashi Wada, Kunio Itoh, Kiyoshi Imai, and Hiroshi Inomata, Annaka, Japan, assignors to Shinetsu Chemical Company

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,157
Claims priority, application Japan, Aug. 15, 1969, 44/64,601
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB **7 Claims**

Organopolysiloxane compositions curable at room temperature and consisting of:

(1) 100 parts by weight of an organopolysiloxane having a viscosity of from 10 to 300,000 cs. at 25° C. and represented by the general formula:

(where R is the same or a different kind of monovalent hydrocarbon radical, free of aliphatic unsaturation, and n is an integer of from 8 to 1,500),

(2) from 0 to 100 parts by weight of an organosiloxane copolymer composed of:

(a) SiO_2 units, (b) $R_3SiO_{0.5}$ units and (c)

$$CH_2{=}CH(R_2)SiO_{0.5}$$

units, (where R is as previously defined, and the molecular ratio of each of the units is $(b+c)/a=0.3$–3, and $c/a=0.01$–1),

(3) from 0.01 to 200 parts by weight of an organosiloxane copolymer whose main chain is composed either of (d) RR'SiO units or of (d) RR'SiO units and (e) $R'SiO_{1.5}$ units, and is terminated with $R''(R_2SiO_{0.5}$ units, $R''OSi(R'_2)O_{0.5}$ units, or $HOSi(R'_2)O_{0.5}$ units, (where R is as previously defined, and at least 1 mole percent of R' group is of vinyl radicals, with the rest being of the same or different kind of monovalent hydrocarbons, free of aliphatic unsaturation, and R'' is either saturated or unsaturated monovalent hydrocarbon radicals, where the ratio of each of the units is $e/(d+e)\leqq0.5$),

(4) an organohydrogen polysiloxane in which the total number of Si–H bonds is from 50 to 500 percent of that of vinyl radicals contained in Components (1), (2) and (3) given above and which contains at least three Si–H bonds in one molecule,

(5) from 1 to 500 parts by weight of an inorganic filler, and

(6) a catalytic amount of a platinum compound.

Such compositions have excellent processability, because they can be cured in a desired time. Therefore, they are very useful as potting or molding materials as well as coating materials on substrates.

3,699,074

POLYIMIDE PREPOLYMER MOLDING POWDERS

Hyman R. Lubowitz, Hawthorne, William P. Kendrick, Manhattan Beach, John F. Jones, Torrance, and Eugene A. Burns, Palos Verdes, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of application Ser. No. 671,973, Oct. 2, 1967. This application Aug. 21, 1970, Ser. No. 65,772
Int. Cl. C08g *20/32, 51/02, 51/10*
U.S. Cl. 260—37 N **2 Claims**

This invention relates to polyimide prepolymer powders and to the process for preparing same, and more specifically, to polyimide prepolymer molding powders having particles with surface areas ranging from about 1 to 800 square meters per gram. More particularly, this invention relates to molding powders prepared from polyimide prepolymers having an average molecular weight ranging from about 500 to 6,000. The prepolymers are prepared by reacting approximately stoichiometric amounts of at least one polyfunctional amine, e.g., an aromatic diamine, one or more polyfunctional anhydrides and a monoanhydride characterized by the formula:

wherein R is selected from the group consisting of hydrogen, lower alkyl radicals having 1 to 5 carbon atoms and combinations thereof.

3,699,075

SOLUBLE HIGH MOLECULAR WEIGHT POLYIMIDE

Hyman R. Lubowitz, Hawthorne, Calif., assignor to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,935
Int. Cl. C08g *20/32*
U.S. Cl. 260—49 **3 Claims**

This invention is directed to aromatic polycarboxylic acids, the anhydrides and isomers thereof, and more particularly, to the use of these acids and anhydrides for the preparation of thermally stable, high-molecular weight polyamides. These polyamides are thermo-oxidatively stable high-molecular weight polyimides which are comparatively soluble in organic solvents. The polyimides are obtained by reacting approximately stoichiometric amounts of the polycarboxylic acid or the anhydrides thereof with a polyfunctional compound selected from the group consisting of polyamines, diisocyanates and combinations thereof.

3,699,076

COLORED CYANOACRYLATE ADHESIVE COMPOSITIONS

William F. Thomsen and Paul T. Von Bramer, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 696,686, Jan. 10, 1968. This application Nov. 25 1970, Ser. No. 92,858
Int. Cl. C08f *1/84, 45/04*
U.S. Cl. 260—41 C **14 Claims**

Autopolymerizable alpha-cyanoacrylate adhesive compositions having incorporated therein disperse dyes of the anthraquinone class which have an amino group and either an aryl group on the amino group, or a phenolic type OH group on the anthraquinone ring.

3,699,077

COMBINATIONS OF PHOSPHONIUM BROMIDES AND BROMINATED AROMATIC COMPOUNDS AS FLAME-RETARDANT COMPOSITIONS FOR OLEFIN POLYMERS

Robert William Murray, Lebanon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,305
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.9 R **3 Claims**

Flame-retardant compositions comprising (A) a compound having the formula

$$R_3\overset{+}{P}R'\cdot Br^- \text{ or } R_3\overset{+}{P}{-}CH_2CH_2{-}\overset{+}{P}R_3{\cdot}2Br^-$$

wherein R is phenyl or 2-cyanoethyl and R' is lower alkyl or 2-cyanoethyl and (B) a brominated aromatic compound containing at least 60%, by weight, of bromine, and olefin polymers containing said compositions, are disclosed.

3,699,078

POLYHYDROXAMIDES AND POLYURETHANES THEREFROM

Anthony J. Castro, Oak Park, Ill., assignor to Akzona Incorporated, Asheville, N.C.

No Drawing. Filed May 18, 1970, Ser. No. 38,561
Int. Cl. C08g 22/08, 22/44
U.S. Cl. 260—47 CB 4 Claims

Polyalkanol arylaliphatic amides and polyurethanes obtained by reaction of such amides with polyisocyanates. The polyurethanes may be formulated for use as foams, coatings, elastomers, and adhesives. The polyurethanes produced according to this invention have excellent fire retardant properties and dimensional stability.

3,699,079

CARBON DIOXIDE-DIEPOXIDE COPOLYMERS

Peter Haynes, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Aug. 11, 1970, Ser. No. 63,031
Int. Cl. C08g 30/04
U.S. Cl. 260—47 EP 10 Claims

A process for copolymerizing one or more diepoxide compounds with carbon dioxide in the presence of a catalytic amount of a composite catalyst comprising an organo-metallic compound of magnesium, zinc, or cadmium, and one or more compounds from the group of polar organic nitro-, nitroso-, azoxy, amine, thiol and sulfoxide compounds and water is disclosed. The resulting products are useful in films and moldings.

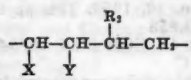
3,699,080

RADIATION SENSITIVE POLYMERS

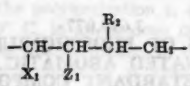
Adnan A. R. Sayigh and Fred A. Stuber, North Haven, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 39,178, May 20, 1970. This application Nov. 27, 1970, Ser. No. 93,445
Int. Cl. C08f 27/06, 27/08
U.S. Cl. 260—47 CZ 3 Claims

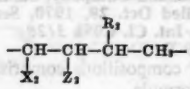
Radiation (thermal and light)-sensitive polymers are provided and are characterized by (1) a recurring unit of the formula:



wherein R_2 is lower-alkoxy or phenyl, one of X and Y is —COOR and the other is —COR_1, R is an azidosulfonylcarbanilyloxy alkylene group and R_1 is —O—dye, —NH—dye or hydroxyarylamino, or (2) a combination in the same polymer chain of recurring units having the formulae:



wherein one of X_1 and Z_1 represents —COOH and the other represents —COOR as defined above, and



wherein one of X_2 and Z_2 represents —COOH and the other represents —COR_1 as defined above. The polymers can be chemically bonded to substrates, such as those containing C—H bonds only (e.g. polyolefins), which are not normally dye receptive. The bonding is effected by exposure to appropriate radiation; the exposure can be carried out imagewise to produce an appropriate image on the substrate. Accordingly, the polymers of the invention find use in the photoresist, printing and like arts.

3,699,081

METHOD FOR STABILIZING ACRYLAMIDE

Akira Iwashita, Tamio Tsunokawa, and Masahiro Yuyama, Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Aug. 25, 1970, Ser. No. 66,864
Claims priority, application Japan, Aug. 30, 1969, 44/68,959
Int. Cl. C07c 103/00
U.S. Cl. 260—561 N 10 Claims

Polymerization of acrylic amides is very effectively inhibited by adding thereto at least one nitrosobenzene derivative having one methyl group at the two ortho positions with regard to the nitroso group. Said nitrosobenzene derivatives are also excellent in that they have a very small coloring activity. Said derivatives exhibit the polymerization-inhibiting effect when they are added during the preparation of acrylic amides or during the storage of the acrylic amides. The amount of said derivatives added normally ranges from 0.00001 to 0.5% by weight based on the weight of acrylic amides, but the preferred amount varies within said range depending upon the environmental conditions of acrylic amides.

3,699,082

METHOD OF PROCESSING PREFORMED POLYESTER RESINS AND CONVERTING TO COATING MATERIALS

Ernest C. Koerner, Robert T. Trice, and William W. Wareham, Fort Wayne, Ind., assignors to Phelps Dodge Magnet Wire Corporation, Fort Wayne, Ind.

No Drawing. Filed July 7, 1969, Ser. No. 839,680
Int. Cl. C08g 22/06, 20/32, 17/14
U.S. Cl. 260—75 NK 18 Claims

A method of processing preformed polyester resin material, said method including the steps of reacting said resin material and selectively exchanging a portion of the ester groups of said resin material for other groups, including amide and/or imide groups and/or reacting said resin material to cause either cross-linking and/or transesterification of said material. Specifically, in accordance with the method of this invention, a preformed thermoplastic linear poly (ethylene terephthalate) polyester resin material can be transformed into a thermosettable polyester resin material or polyamide-ester, polyimide-ester or polyamide-imide-ester resin materials, which may be either thermoplastic or thermosettable resin materials.

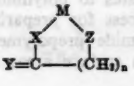
3,699,083

THIOGLYCOLATE CATALYSIS OF PREPARATION OF POLYESTERS

Yuzi Okuzumi, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Aug. 22, 1969, Ser. No. 852,510
Int. Cl. C08g 17/013
U.S. Cl. 260—75 R 2 Claims

Polymeric linear polyesters are prepared by subjecting at least one bis ester of a dicarboxylic acid to alcoholysis in the presence of an excess of a glycol and a catalytic amount of a compound of the general formula



where X and Y are oxygen or sulfur, Z is sulfur, *n* is 1, 2, 3 or 4, and M is a divalent metal selected from the group consisting of magnesium, calcium, strontium, barium, manganese, zinc and cadmium, with the subsequent removal of glycol.

3,699,084

CHEMICALLY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Application June 23, 1970, Ser. No. 49,207, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 157,039

Int. Cl. C08d *1/00*; C08f *1/10*; C08c *11/54*

U.S. Cl. 260—858 **14 Claims**

The invention disclosed is for a new chemically curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The chemically curable liquid polymer composition upon curing in the presence of a chemical free radical generating reagent forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,699,085

PREPARATION OF p-BENZAMIDE POLYMERS AND INTERMEDIATES THEREOF

Thomas Albert Johnson, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,808

Int. Cl. C08g *20/20, 20/04*

U.S. Cl. 260—78 A **36 Claims**

A process which comprises reacting p-aminobenzoic acid or its hydrochloride with thionyl chloride in the presence of a nitrogen containing base compound at a temperature of from about —10° C. to 95° C. to prepare high molecular weight p-benzamide polymers and one or more intermediates therefor.

3,699,086

PHOTO-CROSSLINKABLE ESTERS OF β-SUBSTITUTED α-CYANACRYLIC ACIDS AND PROCESS FOR THEIR MANUFACTURE

Albrecht Moschel, Kelkheim, Taunus, Walter Luders, Neu-Isenburg, and Hartmut Steppan, Wiesbaden, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,640

Claims priority, application Germany, Mar. 20, 1968, P 17 70 003.7

Int. Cl. C08f *27/12*

U.S. Cl. 260—78.4 D **9 Claims**

The present invention relates to esters of β-substituted α-cyanacrylic acids obtained by the conversion of polyhydric alcohols, for example polyvinyl alcohols, with β-substituted α-cyanacrylic acid chlorides, for example benzylidene-α-cyanacetic acid chloride, with the exclusion of short wave-length light, which esters are crosslinkable on exposure to radiation. The esters are used for the manufacture of photocrosslinkable layers, coatings and shaped articles.

3,699,087

HEAT TREATMENT OF AROMATIC SULFIDE POLYMERS

Harold V. Wood and Terry D. Brown, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Mar. 11, 1971, Ser. No. 123,383

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **14 Claims**

The melt flow of thermoplastic poly(arylene sulfide) resins can be decreased by heating at a temperature below the melting point of the polymer in the presence of certain melt flow modifiers, e.g., sulfur. Aromatic sulfide polymers treated in accordance with the invention retain their thermoplastic nature and can be used in a variety of industrial applications, e.g., as molding compositions.

3,699,088

COPOLYMERS OF POLYCYCLIC DIENES

Antonio Carbonaro, Alberto Greco, Gino Dall'Asta, and Nazzareno Cameli, Milan, Italy, assignors to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Mar. 31, 1971, Ser. No. 129,972

Claims priority, application Italy, Apr. 9, 1970, 23,085/70

Int. Cl. C08f *15/40, 19/00*

U.S. Cl. 260—79.5 B **7 Claims**

3-ethylidenetricyclo[4.2.1.$0^{2,5}$]-non-7-ene is prepared by isomerizing 3-vinyltricyclo[4.2.1.$0^{2,5}$]-non-7-ene. Copolymers of this monomer are prepared by polymerization with α-olefins with reduced metal catalysts. Elastomers are obtained from ethylene, propylene and 3-ethylidenetricyclo-[4.2.1.$0^{2,5}$]-non-7-ene. These polymers are sulfur-vulcanizable at an excellent rate and the resulting products have good mechanical properties.

3,699,089

ANHYDROUS SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Continuation-in-part of applications Ser. No. 318,627, Oct. 24, 1963, now abandoned, Ser. No. 393,506, Sept. 1, 1964, now abandoned, Ser. No. 423,034, Jan. 4, 1965, now Patent No. 3,408,429, Ser. No. 424,065, Jan. 7, 1965, now Patent No. 3,361,858, Ser. No. 468,908, July 1, 1965 now Patent No. 3,496,254, Ser. No. 538,978, Mar. 31, 1966, now abandoned, Ser. No. 551,873, May 23, 1966, now Patent No. 3,499,862, and Ser. No. 616,208, Feb. 15, 1967, now Patent No. 3,542,907. This application Sept. 25, 1968, Ser. No. 762,618

Claims priority, application Czechoslovakia, Sept. 7, 1963, 4,971/63

Int. Cl. C08f *15/18*

U.S. Cl. 260—86.1 **13 Claims**

A substantially anhydrous sparingly cross linked hydrophilic polymer capable of being swollen when in contact with water. The polymer consists of at least 98% by weight of a water soluble monoester of acrylic or methacrylic acid, its amides, mixtures and derivatives thereof and not more than 2% by weight of a diester of the monomers. The polymer is three dimensionally cross-linked and in the form of a xerogel or in the form of a gel into which plasticizer may be added.

3,699,090

COPOLYMERS OF N-BUTENE AND 4 METHYL PENTENE-1

Roger M. Nagel, Pennington, N.J., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed Dec. 16, 1966, Ser. No. 602,130

Int. Cl. C08f *15/04*

U.S. Cl. 260—88.2 **2 Claims**

Copolymers of about 85 to 99.5% n-butene and about .5 to 15% 4-methyl pentene-1 and process of preparation using a Ziegler catalyst.

3,699,091

PRODUCTION OF LARGE SURFACE AREA LIGNINS

Mitchell S. Dimitri, Charleston, S.C., and Alfred H. Nissan, Scarsdale, N.Y., assignors to Westvaco Corporation, New York, N.Y.

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,433
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 R 4 Claims

A process for making large surface area lignins which comprises interspersing a barrier material, i.e., an ammonium salt, with lignin particles to reduce coalescence during drying, and spray drying the barrier material-lignin slurry. The barrier material, preferably added in at least a 2 to 1 ratio of barrier material to lignin, is removed during spray drying to produce lignin having a relatively large surface area. Barrier materials having decomposition temperatures above the spray drying temperature require removal subsequent to spray drying.

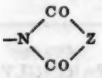
3,699,092

THIAZOLYL-MONOAZO-TETRAHYDROQUINOLINE DYES

Max A. Weaver and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 11, 1967, Ser. No. 608,486
Int. Cl. C09b *29/36*
U.S. Cl. 260—155 8 Claims

Thiazolyl-azo-tetrahydroquinoline compounds, containing a cyclic group of the formula



wherein Z represents —NH—NH— or a chain of carbon atoms and at least one oxygen or sulfur atom or a group having the formula

wherein R^2 represents hydrogen or alkyl, are useful as dyes for hydrophobic textile materials.

3,699,093

PROCESS FOR PRODUCING LARGE SURFACE AREA LIGNINS

Mitchell S. Dimitri, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 806,684, Mar. 12, 1969. This application Apr. 20, 1971, Ser. No. 135,755
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 R 4 Claims

This process is directed to the use of water-immiscible, volatile organic liquids that have a boiling point above 230° F., that are not lignin solvents and form oil-in-water systems to reduce lignin particle contact during drying, thereby reducing coalescence. Such organic liquids contemplated are from the classes of compounds including aromatics, aliphatics and chlorinated hydrocarbons with aliphatic compounds being preferred. This process is useful in making lignins having extremely large surface areas, i.e., above 30 square meters per gram by emulsifying a lignin slurry with a water-immiscible volatile organic liquid having a boiling point above about 230° F., prior to drying.

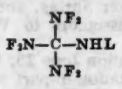
3,699,094

CERTAIN NITROGEN-FLUORINE COMPOUNDS AND METHODS OF PREPARATION

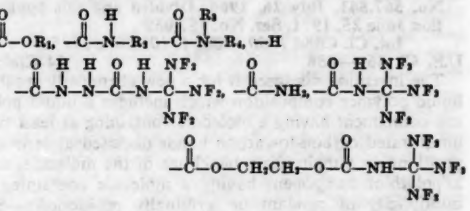
William Charles Firth, Jr., Wilton, and Simon Frank, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application May 9, 1963, Ser. No. 280,492. Divided and this application Oct. 22, 1965, Ser. No. 505,308
Int. Cl. C08b *5/04*; C07c *87/22, 103/10*
U.S. Cl. 260—221 4 Claims

1. A compound having a structural formula

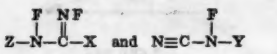


where L is selected from the group consisting of

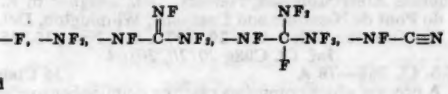


wherein R_1, R_2, R_3, and R_4 are each independently selected from the group consisting of lower alkyl, difluoroamino substituted lower alkyl, and aryl groups.

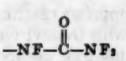
2. The process which comprises (1) reacting a reagent selected from the group consisting of



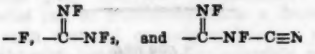
wherein —X is selected from the group consisting of



and



when Z— is F— and wherein —X is —NF—C≡N when Z— is N≡C— and wherein —Y is selected from the group consisting of



with an additive selected from the group consisting of HNCO, HNCS, and $H_2NC{\equiv}N$ to produce an adduct, and (2) reacting said adduct with a compound selected from the group consisting of a lower alkyl alcohol, an alkylene glycol, glycerol, pentaerythritol, phenol, polyvinyl alcohol, nitrocellulose, and difluoraminomethanol.

3,699,095

PROCESS FOR REACTING UNGELATINIZED STARCH WITH A MIXED CARBONIC-CARBOXYLIC ANHYDRIDE OF A POLYCARBOXYLIC ACID

Martin Melvyn Tessler, Edison, and Morton Wolf Rutenberg, North Plainfield, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 2, 1970, Ser. No. 69,122
Int. Cl. C13l *1/08*
U.S. Cl. 260—233.5 6 Claims

Inhibited, granular starch derivatives crosslinked by labile ester linkages resulting from the reaction of starch

with various mixed carbonic-carboxylic anhydrides of polycarboxylic acids are described; said inhibited starch derivatives display utility in food products and other industrial applications.

3,699,096
PROCESS FOR PREPARING PENICILLIN DERIVATIVES
Helmut Wilhelm Otto Weissenburger, deceased, late of Rijswijk, Netherlands, by Ludmilla Weissenburger, nee Lubimowa, administrator, 32 Cromhoutlaan, Rijswijk, Netherlands
No Drawing. Filed Dec. 22, 1969, Ser. No. 1,829
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **13 Claims**

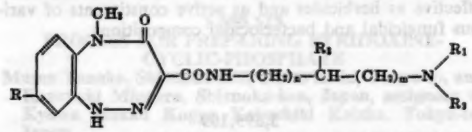
This invention is concerned with the preparation of novel sulfonic acid addition salts of aminopenicillins that have bactericidal activity and with processes for their production.

3,699,097
PENICILLIN COMPOUNDS
Bernard J. Ludwig, North Brunswick, and Frank M. Berger and George M. Fukui, Princeton, N.J., assignors to Carter-Wallace, Inc., New York, N.Y.
No Drawing. Filed July 19, 1968, Ser. No. 746,004
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **15 Claims**

Novel α-hydroxy-β-phenoxyethyl penicillins and salts thereof. The compounds possess valuable antibacterial activity and are particularly useful in cases where hypersensitivity to presently-available penicillins may occur.

3,699,098
CARBOXAMIDES OF BENZOTRIAZEPINES
Silvano Rossi, Milan, Italy, assignor to Roussel-UCLAF, Paris, France
No Drawing. Filed Dec. 31, 1970, Ser. No. 103,319
Claims priority, application France, Dec. 30, 1969, 6945435
Int. Cl. C07d *55/54*
U.S. Cl. 260—239.3 B **14 Claims**

Novel carboxamides of 1,2,5-benzotriazepines of the formula



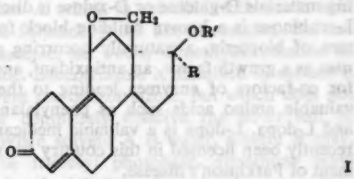
wherein R is selected from the group consisting of hydrogen, halogen, hydroxy, nitro and methoxy, R_1 and R_2 may be different and are alkyl of 1 to 4 carbon atoms and when taken together with the nitrogen atom to which they are attached form a heterocyclic ring which may contain another hetero atom, R_3 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, m and n have the value of 0, 1, 2, or 3 with the sum of m and n being not less than 1 and not more than 3 and their non-toxic, pharmaceutically acceptable acid addition salts and quaternary ammonium derivatives which have a vasodilatatory activity and their preparation and therapeutic use.

3,699,099
11-AMINOALKYLIDENEMORPHANTHRIDINES
Alexander E. Drukker, Milwaukee, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,355
Int. Cl. C07d *41/08, 57/00*
U.S. Cl. 260—239 D **10 Claims**

The compounds are 11-aminoalkylidenemorphanthridines which are useful as central nervous system depressants, skeletal muscle relaxants and antitremor agents. Representative of the compounds disclosed are 11-(3 - dimethylaminopropylidene)morphanthridine and 2-chloro-11(3-dimethylaminopropylidene)morphanthridine.

3,699,100
NOVEL 11β,18-EPOXY STEROIDS
Lucien Nedelec, Clichy-sous-Bois, and Jean-Claude Gasc, Bondy, France, assignors to Roussel-UCLAF, Paris, France
No Drawing. Filed Feb. 3, 1971, Ser. No. 112,386
Claims priority, application France, Feb. 11, 1970, 7004816
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R **7 Claims**

Novel 11β,18-epoxy-$\Delta^{4,9}$-estradienes of the formula



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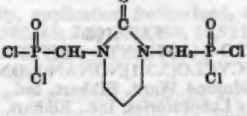
wherein R is selected from the group consisting of hydrogen and ethynyl and R′ is selected from the group consisting of hydrogen, acyl of an organic carboxylic acid of 1 to 18 carbon atoms, lower aliphatic, arylaliphatic and heterocyclic which have anti-androgenic activity, their preparation and intermediates therefrom.

3,699,101
N-(3-HALO - 5,5-DIALKYL-CYCLOHEX-2-EN-1-YLIDENE) MORPHOLINIUM TETRAPHENYL BORATES
Gerhard H. Alt, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Feb. 13, 1970, Ser. No. 11,329
Int. Cl. C07d *87/30*
U.S. Cl. 260—247 **3 Claims**

N-heterocyclic substituted (3-halo-5,5-dialkylcyclohex-2-en-1-ylidene) tetraphenyl borates for use in combating helminthiasis in animals, particularly ruminants.

3,699,102
PRODUCTION OF UREIDOMETHYLPHOSPHONYL HALIDES
Harro Petersen, Frankenthal, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Dec. 15, 1969, Ser. No. 885,376
Int. Cl. C07d *51/18*
U.S. Cl. 260—251 P **2 Claims**

The production of heterocyclic ureidomethylphosphonyl halides such as the compound



by reaction of urea compounds with phosphorus trihalides and the new ureidomethylphosphonyl halides themselves. The new products are flame retardants for surface coating agents and plastics and are valuable starting materials

for many syntheses, particularly for the production of flame retardants, auxiliaries in the surface coating and plastics field, plants protection agents and dyes.

3,699,103

PROCESS FOR THE MANUFACTURE OF 5-DESOXY-L-ARABINOSE AND NOVEL INTERMEDIATES

Joseph Kiss, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,912

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R **14 Claims**

A multi-step, stereo-specific synthesis of 5-desoxy-L-arabinose from the readily available and inexpensive starting materials D-glucose or D-xylose is disclosed. 5-desoxy-L-arabinose is a known building block for the manufacture of biopterin, a naturally occurring material having uses as a growth factor, an antioxidant, and as a precursor for co-factors of enzymes leading to the production of valuable amino acids such as phenylalanine, tryptophan and L-dopa. L-dopa is a valuable medicament which has recently been licensed in this country for use in the treatment of Parkinson's disease.

3,699,104

8-CHLORO-10-(1-PIPERAZINYL) - 10,11 - DIHYDRO-DIBENZO[b,f]THIEPIN AS A CENTRAL NERVOUS DEPRESSANT

Walter Schindler, Riehen, near Basel, Erich Schmid, Basel, and Armin Züst, Birsfelden, Basel-Land, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,904

Claims priority, application Switzerland, Feb. 21, 1968, 2,529/68; Jan. 31, 1969, 1,592/69

Int. Cl. C07d *5/70*

U.S. Cl. 260—268 TR **3 Claims**

8 - chloro - 10-(1-piperazinyl)-10,11-dihydro-dibenzo-[b,f] thiepin and the pharmaceutically acceptable acid addition salts thereof have a depressant effect on the central nervous system; pharmaceutical compositions comprising these compounds and methods of producing a depressant effect in warm-blooded animals are provided.

3,699,105

4-[1-(ω-BENZOYLALKYL)-3-PYRROLIDINYL]-2H-1,4-BENZOXAZIN-3(4H)-ONES

Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed July 7, 1969, Ser. No. 839,705

Int. Cl. C07d *87/50*

U.S. Cl. 260—244 R **6 Claims**

4 - [1 - (ω - benzoylalkyl) - 3 - pyrrolidinyl] - 2H-1,4-benzoxazin - 3(4H) - ones prepared by condensation of 4 - (3 - pyrrolidinyl) - 2H - 1,4 - benzoxazin - 3(4H)-ones and ω-benzoylalkyl halides. The compounds are tranquilizers.

3,699,106

6,7 BENZO-2-(4-PHENYL-1-PIPERAZINYL) BICYCLO[3.3.1]NONAN-9-ONE

Frederick Edmund Ward, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 26, 1971, Ser. No. 128,587

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR **4 Claims**

The isomeric axial and equatorial 6,7-benzo-2-(4-phenyl-1-piperazinyl)bicyclo [3.3.1]nonan-9-ones are novel compounds with tranquilizing activity.

3,699,107

1-[2- OR 3-[4-(10,11 - DIHYDRO-DIBENZ[b,f]-THIEPIN - 10-YL)-1-PIPERAZINYL]-ALKYL]-3-ALKYL - 2 - IMIDAZOLIDINONE DERIVATIVES

Walter Schindler, Riehen, near Basel, Erich Schmid, Basel, and Armin Züst, Basel-Land, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,954

Claims priority, application Switzerland, Feb. 21, 1968, 2,529/68; June 27, 1968, 9,626/68; Nov. 19, 1968, 17,229/68

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR **6 Claims**

Compounds of the class 1-[2- or 3-[4-(10,11-dihydro-dibenz[b,f] - thiepin-10-yl)-1-piperazinyl]-alkyl]-3-alkyl-2-imidazolidinone which can be substituted in 8-position of the dibenzo[b,f]thiepine moiety by chloro, methyl, trifluoromethyl, methoxy or methylthio and the pharmaceutically acceptable acid addition salts thereof, have a depressant effect on the central nervous system; pharmaceutical compositions comprising these compounds and methods of treatment, particularly methods of inducing a depressant effect in warm-blooded animals are provided; an illustrative embodiment is 1-[2-[4-(8-chloro-10,11-dihydrodibenzo[b,f]thiepin-10-yl) - 1 - piperazinyl]-ethyl]-3-methyl-2-imidazolidinone.

3,699,108

SUBSTITUTED POLYHALO-4-NITROPYRIDINES

Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application July 3, 1969, Ser. No. 839,066, now Patent No. 3,629,281, dated Dec. 21, 1971. Divided and this application Mar. 18, 1971, Ser. No. 125,873

Int. Cl. C07d *31/14*

U.S. Cl. 260—290 HL **2 Claims**

Disclosed as novel compounds are polyhalo-4-nitropyridine derivatives which are substituted in the 6-position by cyano, trifluoromethyl or methylsulfonyl groups. The compounds have utility as pesticides and are variously effective as herbicides and as active constituents of various fungicidal and bacteriocidal compositions.

3,699,109

TROPYL ESTER OF 2-PHENYL-CYCLOHEXEN-3-CARBOXYLATE

Luigi Turbanti, Via B da Padule 10, Pisa, Italy

No Drawing. Filed Oct. 2, 1968, Ser. No. 766,029

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **2 Claims**

The invention provides amino esters, salts thereof and quaternary compounds thereof with alkyl halides, which compounds exhibit a high degree of antispastic activity and antiulcer activity. The invention also relates to the production of these compounds.

3,699,110

CERTAIN 1-ARYL OR ARALKYL-3-(PYRIDYL) FORMIMIDOYL-UREAS OR THIOUREAS

William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 5, 1970, Ser. No. 87,332

Int. Cl. C07d *31/50, 31/40*

U.S. Cl. 260—294.8 E **9 Claims**

Pyridylaminidinoureas having insecticidal properties.

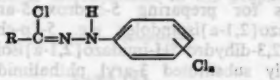
3,699,111

HALOGEN SUBSTITUTED PYRININEALDEHYDE PHENYL HYDRAZONES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,166
Int. Cl. C07d *31/40, 31/42*
U.S. Cl. 260—296 R 6 Claims

This invention relates to novel heterocyclic acid chloride phenylhydrazones embraced by the formula



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wherein R is a radical selected from the group consisting of furyl, thienyl and pyridyl, each of which has from zero through three substituents selected from the group consisting of alkyl, halo and nitro, and *n* is an integer of from zero through three. These compounds are primarily useful as insecticides and miticides and also as herbicides, anti-inflammatories and anthelmintics.

3,699,112

PAPER COATING PIGMENT BINDER OF ALCOHOLIZED VINYL ACETATE-ACRYLAMIDE COPOLYMER

Kozo Konishi, Masaaki Suzui, Michio Otake, and Tatuo Maeda, Nishi Kubiki-gun, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1969, Ser. No. 806,213
Claims priority, application Japan, Mar. 18, 1968, 43/17,281; Mar. 27, 1968, 43/19,442
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 UA 7 Claims

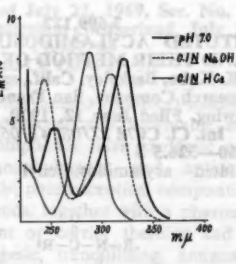
A paper coating composition having an improved fluidity and water resistance can be obtained by using as a pigment binder an alcoholysis product of vinyl acetate-acrylamide copolymer or a copolymer of vinyl acetate, acrylamide and one or more other copolymerizable monomer, or the product added with a water resistance agent without lessening the inherent characteristic of PVA.

3,699,113

PROCESS FOR PREPARING PYRIDOXINE-CYCLIC-PHOSPHATE

Masao Tanaka, Shizuoka-ken, Teruo Kishi, Tokyo-to, and Kazuyuki Mineura, Shizuoka-ken, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of abandoned application Ser. No. 744,962, July 15, 1968. This application Feb. 1, 1971, Ser. No. 111,660
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 V 7 Claims



The present invention relates to preparation of pyridoxine-cyclic-phosphate by direct phosphorylation of pyridoxine or its salts with poly-phosporic acid.

3,699,114

PROCESS FOR PRODUCING SILVER SALT OF BENZOTRIAZOLE

Kinji Ohkubo, Junpei Noguchi, and Takao Masuda, Ashigara-Kamigun, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of abandoned application Ser. No. 629,963, Apr. 11, 1967. This application July 20, 1970, Ser. No. 56,521
Claims priority, application Japan, Apr. 12, 1966, 41/23,054
Int. Cl. C07d *55/04*
U.S. Cl. 260—299 16 Claims

The silver salt of benzotriazole having a particle size of less than 5 microns in length is prepared by a specific combination of solvents used for the reaction of silver nitrate and benzotriazole in solution. Silver nitrate is dissolved in solvent A which is miscible with nitric acid which might be formed by the above reaction. Solvent A may, for example, be water, dimethylformamide or dimethylsulfoxide. Benzotriazole is dissolved in solvent B which is a solvent for benzotriazole, but which does not substantially or completely dissolve the silver salt of benzotriazole. When solvent A is water, solvent B may, for example, be tricresyl phosphate, dimethoxy ethyl phthalate, di-n-butyl phthalate, diethyl sebacate, mono-octyl-dibutyl phosphate, tributyl phosphate or castor oil. Where solvent A is dimethyl formamide or dimethyl sulfoxide, solvent B may, for example, be cottonseed oil, linseed oil or tsubaki oil. Solutions of silver nitrate in solvent A and benzotriazole in solvent B are mixed to form the silver salt of benzotriazole. The product is washed with washing liquid C which may, for example, be methanol, ethanol or acetone. To the reaction system there can be added a surfactant to make the size of the obtained particles uniform.

3,699,115

3-ARYL-ISOTHIAZOLE-4,5-DICARBOXYLATES

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 25, 1969, Ser. No. 879,927
Int. Cl. C07d *91/12*
U.S. Cl. 260—302 A 7 Claims

Preparation of 3-aryl-isothiazole - 4,5 - dicarboxylates from 5-aryl-1,3,4-oxathiazol-2-ones and acetylenedicarboxylic acid esters and their use as contact broadleaf herbicides.

3,699,116

2,2'-AZINES OF 2,4-THIAZOLIDINEDIONES

Alex Meisels, Basel, and Emilio Schott, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 587,996, Oct. 20, 1966. This application Oct. 1, 1969, Ser. No. 862,936
Claims priority, application Switzerland, Oct. 29, 1965, 14,985/65; July 17, 1969, 10,911/69
Int. Cl. C07d *91/18*
U.S. Cl. 260—306.7 20 Claims

2,2'-azines of 2,4-thiazolidinediones are useful for the inhibition of the growth of tumors. An illustrative embodiment is the 2,2'-azine of 3,5-dimethyl-2,4-thiazolidinedione and 3-(2-methylallyl)-2,4-thiazolidinedione, 2,4-thiazolidinedione-2-(3-thiosemicarbazones) are useful as intermediates in their production.

3,699,117

2-[(5'-(3'-AND/OR 4'-SUBSTITUTED) ISOXAZOLYL) AMINOETHYL] - 3,4,10 - TRIOXO-1,2,3,4,4,9,9,10-OCTAHYDROANTHRACENES AND RELATED COMPOUNDS

Kenneth Butler, Old Lyme, and Lloyd H. Conover, Quaker Hill, Conn., and Robert B. Woodward, Belmont, Mass., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Division of application Ser. No. 608,730, Jan. 12, 1967, now Patent No. 3,502,660, which is a continuation-in-part of application Ser. No. 484,723, Sept. 2, 1965, now abandoned, which is a division of application Ser. No. 209,268, July 11, 1962, now abandoned, which in turn is a continuation-in-part of application Ser. No. 133,011, Aug. 18, 1961. This application July 29, 1969, Ser. No. 845,872

Int. Cl. C07d *85/22*

U.S. Cl. 260—307.5 7 Claims

A multi-route process for the synthesis of tetracycline-type antibiotics involving (1) the aldol condensation of a 3,4,10 - trioxo - 1,2,3,4,4a,9,9a,10-octahydroanthracene and a 3- and/or 4-substituted-5-formylisoxazole; (2) dehydration of the aldol condensation products to a 2-[(5'-(3'- and/or 4'-substituted)isoxazolyl)methylidene] - 3,4,10-trioxo - 1,2,3,4,4a,9,9a,10 - octahydroanthracene; followed by (3) Michael addition of an amine to produce 2-[(5'-(3'- and/or 4' - substituted)isoxazolyl)substituted aminomethyl] - 3,4,10 - trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracenes; (4) chemical or catalytic reduction of the [(isoxazolyl)aminomethyl]-3,4,10-trioxo-octahydroanthracenes to 3-hydroxy-4,10-dioxo- and 4,10-dioxo derivatives, respectively; (5) cleavage of the isoxazole ring of the reduced compounds to the corresponding 4,10-dioxo - 1,2,3,4,4a,9,9a,10 - octahydroanthracene - 2 - [α-(amino)acetonyl-α-nitriles]; (6) followed by cyclization of 12a-deoxytetracycline or tetracycline derivatives; or, alternatively, (7) cyclization of [(isoxazolyl)aminomethyl]-4,10-dioxo-octahydroanthracenes to naphthaceno(3,2-D)isoxazoles with subsequent cleavage of the isoxazole ring to produce 12a-deoxytetracyclines; and (8) 12a-hydroxylation of a tetracycline. The intermediate compounds of the process are limited to the following classes: 2-[(5'-(3'- and/or 4'-substituted)isoxazolyl)methylidene]-3,4,10-trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracenes; 2-[5'-(3'- and/or 4'-substituted isoxazolyl)aminomethyl]-4,10 - dioxo-1,2,3,4,4a,9,9a,10-octahydroanthracenes, the 3-oxo, the 3-hydroxy, the 3-lower alkanoyloxy and the 3,4-cyclic carbonates thereof; 4,10-dioxo-1,2,3,4,4a,9,9a,10-octahydroanthracene-2-[α-(amino)acetonyl - α - nitriles]; and naphthaceno (3-2-D)-isoxazoles all of which are useful as bactericides and/or chelating agents.

3,699,118

REACTION PRODUCTS OF SUBSTITUTED IMIDAZOLINES AND AMINO TRI(LOWER ALKYLIDENEPHOSPHONIC ACIDS)

James E. Donham, Houston, Tex., assignor to Amoco Production Company, Tulsa, Okla.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,031

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 2 Claims

An amino phosphonic acid is made dispersible in organic solvents to form clear solutions by reacting the acid in water solution with an imidazoline having an alkyl side chain containing at least about eight carbon atoms. The resulting reaction product is highly soluble in a wide variety of organic solvents. It is useful as a scale inhibitor, corrosion inhibitor, paraffin solvent and inhibitor, and acid retarder in oil wells. It has other uses in the oil field and outside the oil field.

3,699,119

PROCESS FOR 5 H-IMIDAZO[2,1-a]ISOINDOLES

Marcel K. Eberle, Madison, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application June 19, 1968, Ser. No. 738,121, now Patent No. 3,597,445, dated Aug. 3, 1971. Divided and this application Feb. 16, 1971, Ser. No. 115,716

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 9 Claims

Process for preparing 5-hydroxy-5-aryl-2,3-dihydro-5H-imidazo[2,1-a]isoindoles, e.g., 5-(p-chlorophenyl)-5-hydroxy-2,3-dihydro-5H-imidazo[2,1-a]isoindole. An appropriately substituted 3-aryl phthalimidine is treated with triethyloxonium borontetrafluoride to provide an intermediate 3-ethoxy-1H-isoindole which is converted to the final product by treatment with ethyleneimine hydrotetrafluoroborate and contacting the resulting product with air or oxygen. These compounds are useful as psychic energizers and anorectics.

3,699,120

METHOD OF PRODUCING INDOLE

Jan Magnus Bakke and Harald Erik Heikman, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,881
Claims priority, application Sweden, Oct. 30, 1969, 14,902/69

Int. Cl. C07d *27/56*

U.S. Cl. 260—319.1 11 Claims

Indole is produced in high yields in one single stage by contacting gaseous 2-(o-nitrophenyl)-ethanol together with a reducing gas or a mixture of reducing gas and inert gas over a hydrogenation catalyst heated to a temperature of about 200 to 400° C.

3,699,121

ANTIBIOTIC

Kei Arima, Gakuzo Tamura, Hiroshi Imanaka, Masanobu Kousaka, and Akio Fukuda, Tokyo, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd.

Continuation of application Ser. No. 440,747, Mar. 18, 1965. This application June 28, 1967, Ser. No. 649,745
Claims priority, application Japan, Mar. 25, 1964, 39/16,338

Int. Cl. A61k *21/00*

U.S. Cl. 260—326.9 1 Claim

3-(2-nitro-3-chlorophenyl) - 4 - chloropyrrole (called pyrrolnitrin) and methods of preparation through cultivation of *Pseudomonas pyrrocinia, Pseudomonas aeruginosa, Pseudomonas mephitica, Pseudomonas ovalis and Pseudomonas shuylkilliensis* followed by separation from the culture broth. The compound is an antibiotic, useful in the treatment of fungal diseases in warm blooded animals.

3,699,122

N-SUBSTITUTED ACYLAMIDOSULFENYL CHLORIDES AND THEIR METHOD OF PREPARATION

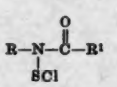
Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed June 12, 1970, Ser. No. 45,902

Int. Cl. C07d *27/08, 41/06, 29/22*

U.S. Cl. 260—326.5 S 5 Claims

N-substituted acylamidosulfenyl chlorides of the formula



wherein R is an alkyl group of from 1 to 10 carbon atoms or cycloalkyl group of from 3 to 10 carbon atoms, the alkyl or cycloalkyl groups being optionally substituted

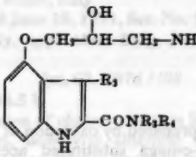
with halogen atoms and R^1 is hydrogen, alkyl of from 1 to 10 carbon atoms or cycloalkyl of from 1 to 10 carbon atoms, the alkyl or cycloalkyl groups being optionally substituted with halogen atoms; with the proviso that R and R^1 may be joined to form a linear alkylene radical of 3 to 5 carbon atoms which is bound to the carbonyl and nitrogen to form a ring. The compounds are prepared by reacting N-substituted carboxamines with sulfur dichloride. The N-substituted acylamidosulfenyl chlorides are useful intermediates in the preparation of pesticides.

3,699,123
4-(3-AMINO-2-HYDROXY-PROPOXY) INDOLE DERIVATIVES

Fritz Seemann, Basel, and Franz Troxler, Bottmingen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed Mar. 16, 1971, Ser. No. 124,956
Claims priority, application Switzerland, Mar. 24, 1970, 4,373/70, 4,377/70; Nov. 18, 1970, 17,036/70
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.14 R **14 Claims**

The present invention concerns novel compounds of the formula:



wherein R_1 is lower alkyl, cycloalkyl of 3 or 4 carbon atoms or phenylalkyl of at least 8 carbon atoms, the phenyl nucleus thereof being separated from the nitrogen atom by at least two alkyl carbon atoms, R_2 is hydrogen or methyl, and each of R_3 and R_4 is hydrogen or lower alkyl, or R_3 is amino, lower alkylamino, cycloalkyl of 3 or 4 carbon atoms or phenyl, and R_4 is hydrogen, or R_3 and R_4, together with the nitrogen atom to which they are bound, are 1-pyrrolidinyl, 1-piperidinyl or 1-morpholinyl, and acid addition salts thereof.

The compounds and their pharmaceutically acceptable acid addition salts have a blocking effect on the adrenergic β-receptors.

3,699,124
2-BENZOYL INDOLE DERIVATIVES

Andre Gagneux, Basel, Switzerland, and Arne Elof Brandstrom, Goteborg, and Stig Ake Ingomar Carlsson, Molnlycke, Sweden, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed July 22, 1969, Ser. No. 34,202
Claims priority, application Switzerland, July 23, 1968, 11,047/68
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.15 **6 Claims**

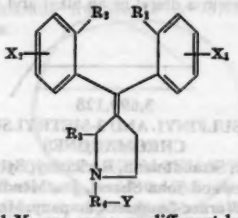
2-benzoyl-2-(2-tertiaryamino - ethoxy)-indole derivatives and their pharmaceutically acceptable acid addition salts, which compounds have analgesic as well as tranquilising, antianaphylactoid and antioedematous activities in mammals; pharmaceutical compositions comprising said compounds, together with a pharmaceutically acceptable diluent or carrier therefor and methods for producing analgesic, tranquilising, antianaphylactic and antioedematous effects in mammals are also provided; an illustrative embodiment is 1-ethyl-2-(p-ethoxybenzoyl)-3 - (2-diethylamino-ethoxy) - 5,6-methylenedioxy-indole.

3,699,125
1,2,3-TRISUBSTITUTED PYRROLIDINE DERIVATIVES

Suminori Umio, Kawanishi-shi, and Shizuo Maeno, Osaka-shi, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,328
Claims priority, application Japan, Jan. 9, 1969, 44/1,788, 44/1,790, 44/1,791
Int. Cl. C07d
U.S. Cl. 260—326.81 **6 Claims**

1,2,3-trisubstituted pyrrolidine derivatives of the general formula:



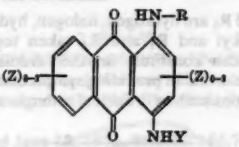
wherein X_1 and X_2 are same or different hydrogen, halogen, lower alkyl or lower alkoxy; Y is hydroxy or halogen; R_1 and R_2 are hydrogen or R_1 and R_2 are bound together intervening ethylene, oxygen or sulfur; R_3 is lower alkyl; and R_4 is lower alkylene and pharmaceutically acceptable salts thereof. These compounds are useful as anti-gastoric secretion inhibiting or anti-tremor agents.

3,699,126
ANTHRAQUINONE DYESTUFFS

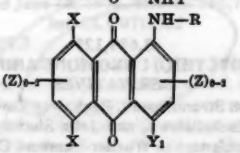
Karl-Heinz Peters, Cologne-Buchheim, and Rütger Neeff, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 25, 1969, Ser. No. 836,634
Claims priority, application Germany, June 26, 1968, P 17 68 745.5, P 17 68 756.8, P 17 68 755.7
Int. Cl. C07c *49/68;* **C07d** *63/04*
U.S. Cl. 260—329.2 **2 Claims**

Dyestuffs of the formulae

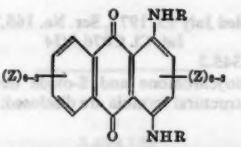


(I)



(II)

and



(III)

wherein Z is a substituent, one X is a member NHR and the other is hydrogen or a substituent Z, Y is an optionally substituted hydrocarbon residue or an acyl group, Y_1 is hydrogen or a substituent, and R is a moiety

CO—B—CO—NH—E

where B is a bond, saturated or unsaturated alkylene with or without hetero atoms and substituents, mono or polynuclear arylene with or without substituents, cycloalkylene with or without substituents or heteroarylene with or without substituents and E is a radical B or an aralkyl group; as well as their preparation and use as pigments the novel dyestuffs are pigment dyestuffs and free of sulfonic acid and carboxylic acid groups.

3,699,127
PLASTICIZED CYANOACRYLATE ADHESIVE COMPOSITIONS

Denis J. O'Sullivan, and Bernard J. Bolger, both of Dublin, Ireland, assignors to Loctite (Ireland), Limited, Dublin, Ireland

Filed Oct. 7, 1970, Ser. No. 78,948
Claims priority, application Ireland, Oct. 10, 1969, 1406/69
Int. Cl. C08g 51/34
U.S. Cl. 260—33.2 13 Claims

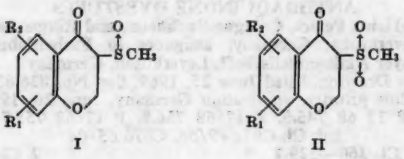
Adhesive compositions containing polymerizable esters of α-cyanoacrylic acid are imparted improved properties by incorporating therein a diaryl or an alkyl aryl ether as a bond plasticizer.

3,699,128
3-METHYLSULFINYL AND 3-METHYLSULFONYL-4-CHROMANONES

Maximilian Von Strandtmann, Rockaway; Sylvester Klutchko, Hackettstown, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 26, 1971, Ser. No. 147,184
Int. Cl. C07d 7/34
U.S. Cl. 260—345.2 8 Claims

The present invention is concerned with compounds of type I and II.



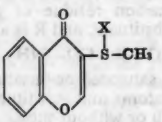
wherein R_1 and R_2 are hydrogen, halogen, hydroxy, alkoxy, alkyl, aryl, aralkyl and R_1 and R_2 taken together with the benzene ring can constitute another aromatic ring. These compounds are useful in providing symptomatic relief of allergic manifestations such as bronchial asthma.

3,699,129
3-(METHYLTHIO) CHROMONE AND S-OXIDE DERIVATIVES

Maximilian Von Strandtmann, Rockaway Township; Sylvester Klutchko, Hackettstown, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

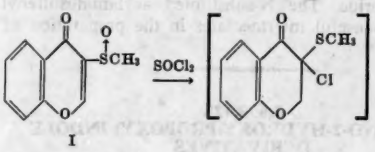
Filed July 15, 1971, Ser. No. 165,757
Int. Cl. C07d 7/34
U.S. Cl. 260—345.2 5 Claims

3-(Methylthio)chromone and S-oxide derivatives having the following structural formula are disclosed:

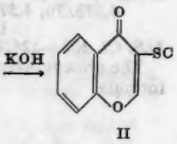


wherein X is O, O_2 or non-existant.

These compounds where X is non-existent are prepared as follows:



I



II

The S-oxides are prepared by oxidation of II or by ring closure of o-hydroxy-omega substituted acetophenone with triethylorthoformate using base catalysts.

The above compounds are useful in treating gastric hyperacidity.

3,699,130
HALO AZIDO NAPHTHALENES

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 26, 1971, Ser. No. 147,117
Int. Cl. C07c 117/00
U.S. Cl. 260—349 3 Claims

Novel halo azido naphthalenes and dry photoimaging processes and compositions employing said naphthalenes are disclosed.

3,699,131
PROCESS FOR PRODUCING VINYL GLYCIDYL ETHER FROM LOW BOILING ALKYL VINYL ETHERS

Ting I. Wang, Newtown Square, Pa., and Glenn M. Nakaguchi, Fullerton, Calif., assignors to Atlantic Richfield Company, New York, N.Y.

Filed April 8, 1970, Ser. No. 26,793
Int. Cl. C07d 1/18
U.S. Cl. 260—348 R 7 Claims

An improved process for producing vinyl glycidyl ether by means of the transvinylation reaction comprising passing methyl vinyl ether or ethyl vinyl ether through a solution of a mercuric compound catalyst and glycidol in a high boiling solvent at atmospheric or superatmospheric pressure and moderate temperature.

3,699,132

8,9-EPOXYPERILLARTINE SWEETENERS

Edward M. Acton, Menlo Park; Morris A. Leaffer, Palo Alto, and Herbert Stone, Menlo Park, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 2, 1970, Ser. No. 69,165
Int. Cl. C07d *1/00, 1/06*
U.S. Cl. 260—348 R 4 Claims

8,9-Epoxyperillartine optical isomers having good sweetness and no or moderately low bitter aftertaste characteristics, along with an increased solubility in water as compared with the corresponding perillartine precursor isomers. These epoxy derivatives are also free of the undesirable gingery-licorice taste of perillartine. The new compounds give no evidence of toxicity and can be employed in foods as synthetic sweetening ingredients.

3,699,133

PROCESS FOR THE PREPARATION OF OLEFINE OXIDES

Giuseppe Messina, Alghero; Giorgio Montorsi, and Giuseppe Caprara, both of Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 10, 1971, Ser. No. 151,978
Claims priority, application Italy, June 12, 1970, 25899 A/70
Int. Cl. C07d *1/08*
U.S. Cl. 260—348.5 V 9 Claims

In the preparation of olefine oxides in liquid phase reaction between olefines, isobutyric aldehyde and oxygen in the presence of a catalyst, improvement in minimizing formation of isobutyric acid is achieved by using a titanium compound as the catalyst.

3,699,134

PRODUCTION OF ANTHRAQUINONE

Herbert Armbrust; Hans Juergen Sturm, both of Gruenstadt; Heinz Engelbach, Limburgerhof; Hermann Wistuba, Mannheim; Armin Stoessel, Frankenthal, and Richard Krabetz, Kirchheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed June 23, 1970, Ser. No. 49,166
Claims priority, application Germany, July 4, 1969, P 19 34 063.7; Sept. 13, 1969, P 19 46 470.1
Int. Cl. C09b *1/00*
U.S. Cl. 260—369 22 Claims

Production of anthraquinone by catalytic oxidation of indans with oxygen. Anthraquinone obtainable by the process is a starting material for the production of dyes and pesticides.

3,699,135

ORGANOSILICON POLYMERIC DYES

John L. Baptista; Frederick J. Rauner, and John A. Ford, Jr., all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1969, Ser. No. 851,046
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB 7 Claims

Polymeric dyes prepared by the copolymerization of a diorganodifunctionalsilane with a derivative of anthraquinone containing two aliphatic hydroxy groups. The polymeric dyes are useful as coloring material in photoresist formulations and for other purposes.

3,699,136

PREPARATION OF CORTISONE COMPOUNDS AND PREDNISONE COMPOUNDS

Joel E. Huber, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 6, 1972, Ser. No. 215,918
Int. Cl. C07c *169/34*
U.S. Cl. 260—397.45 4 Claims

Δ^4-3,11,20-Triketo steroids are iodinated in the presence of azobisisobutyronitrile to produce a mixture of unstable iodides, and the latter are treated with acylolysis reagents to produce a substantial fraction of $\Delta^{1,4}$-3,11,20-triketo-21-acyloxy products.

3,699,137

PRODUCTION OF POTASSIUM TITANYL OXALATE

Erich Termin, Laufenburg, and Otto Bleh, Bergheim, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Postfach, Germany

Filed Dec. 8, 1970, Ser. No. 96,242
Claims priority, application Germany, Dec. 13, 1969, P 19 62 641.6
Int. Cl. C07f *7/28*
U.S. Cl. 260—429.5 7 Claims

Process for the production of potassium titanyl oxalate which comprises heating a tetraalkyl titanate with about three times the molar amount of water and twice the molar amount of potassium hydrogen oxalate. If desired, two thirds of the water is added initially and the balance subsequently. A solvent such as an alkanol may be employed. Advantageously the reaction, distillation of volatiles, crystallization and drying are all performed in the same vessel.

3,699,138

PREPARATION OF DISTANNANES

Eugene J. Debreczeni, and Bernard G. Kushlefsky, both of Edison, N.J., assignors to M&T Chemicals, Inc., Greenwich, Conn.

Filed June 18, 1971, Ser. No. 154,702
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 5 Claims

Distannanes of the formula $R_3Sn—SnR_3$, wherein R represents a monovalent hydrocarbon radical, are prepared in high yield and purity by reacting the corresponding triorganotin halide with molten metallic sodium at elevated temperature in the absence of any solvent or diluent other than the reactants.

3,699,139

SYNTHETIC CRYSTALLINE ALUMINOSILICATE

Mae K. Rubin, Bala Cynwyd, Pa., and Edward J. Rosinski, Deptford, N.J., assignors to Mobil Oil Corporation

Filed Oct. 16, 1969, Ser. No. 867,063
Int. Cl. C01b *33/28*
U.S. Cl. 260—448 C 4 Claims

A novel synthetic crystalline aluminosilicate zeolite having a rigid three dimensional structure characterized by having benzyltrimethylammonium ions in the structure; method for preparing the crystalline aluminosilicate from a mixture of sodium oxide, potassium oxide, silica, alumina, water and benzyltrimethylammonium compound and organic compound conversion with a catalytically-active form of the new zeolite.

3,699,140
ORGANOSILICON COMPOUNDS

Grish Chandra; William J. Owen; Norman C. Lloyd, and Bryan E. Cooper, all of Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, England

Filed July 30, 1970, Ser. No. 59,701

Claims priority, application Great Britain, July 30, 1969, 38,158/69

Int. Cl. C07f 7/10, 7/18

U.S. Cl. 260—448.2 N **2 Claims**

Organosilicon compounds, polymers and copolymers have been prepared containing acetylenic linkages between adjacent silicon atoms. The basic compounds are defined by the general formula $R'(R_2Si)_m(C\equiv C)—(C\equiv C)—(SiR_2)_nR''$ where R' and R'' are each H, halogen, hydrocarbonoxy or $—NO_2$ as above defined, monovalent hydrocarbon or monovalent halogenohydrocarbon, *m* is 1 to 4, *n* is 0 to 4, R'' being H, alkyl, aryl or trihydrocarbylsilyl when *n* is 0. The polymers can be defined by the unit formula $(OSiR_2—C\equiv C—C\equiv C—SiR_2—)$ and may be copolymers containing units of the formula $Q_aSiO_{(4-a)/2}$ where Q is monovalent hydrocarbon or halogenohydrocarbon and *a* is 0 to 3. The novel compounds are useful as cross-linkers.

3,699,141
NOVEL PROCESS FOR MAKING HALOSILYL CARBON COMPOUNDS AND NOVEL HALOSILYL CARBON COMPOUNDS PRODUCED THEREBY

Robert A. Benkeser, W. Lafayette, Ind., and William E. Smith, Cambridge, Mass., assignors to Purdue Research Foundation, Lafayette, Ind.

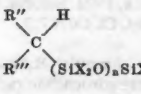
Filed March 10, 1970, Ser. No. 18,330

Int. Cl. C07f 7/04, 7/12

U.S. Cl. 260—448.2 R **36 Claims**

Novel process for producing halosilyl carbon compounds by reacting, under anhydrous conditions in the presence of a tertiary amine, a trihalosilane having one silicon-bonded hydrogen atom per molecule with a carbon compound having oxygen bonded only to carbon, such as an aldehyde or ketone, to exchange the oxygen bonds with a carbon to silicon bond and a carbon to hydrogen bond. A normally liquid organic nitrile solvent which does not substantially chemically combine with the reactants or products of the process can be used.

Novel halosilyl carbon compounds having the formula:



wherein R'' is selected from the class consisting of alkaryl groups and haloalkyl groups, R''' is selected from the class consisting of hydrogen and aryl groups, X is halogen and *n* is 0 or 1. The novel compounds can be transformed by known methods into resinous siloxanes useful as, for example, potting compositions.

3,699,142
BIS (HALOSILYL) ORGANIC COMPOUNDS AND PROCESS OF MAKING SAME

Robert A. Benkeser, W. Lafayette, Ind., and William E. Smith, Cambridge, Mass., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed March 10, 1970, Ser. No. 18,331

Int. Cl. C07f 7/04, 7/12

U.S. Cl. 260—448.2 R **39 Claims**

Novel process for producing bis(halosilyl) organic compounds by reacting two moles of a trihalosilane having one silicon-bonded hydrogen atom per molecule with one mole of a carbonyl halide in the presence of a tertiary amine. A normally liquid organic nitrile solvent which does not chemically combine with the reactants or products of the process can be used.

Novel bis(halosilyl) organic compounds having the formula,

$$R''CH(SiX_3)_n(SiHX_2)_{2-n}$$

wherein *n* is an integer of 1 to 2, R'' is a monovalent hydrocarbon group having at least two carbon atoms, or a monovalent group of the formula,

wherein R' is selected from the class consisting of halogen atoms and R'''O—groups wherein R''' is a monovalent hydrocarbon group, and R'' is a divalent hydrocarbon group; a monovalent group of the formula,

halogen atoms; and a monovalent group of the formula R'''O—; and X is a halogen atom. The novel compounds can be converted by hydrolysis and/or condensation into resinous siloxanes useful as, for example, potting compositions.

3,699,143
NOVEL PROCESS FOR THE MANUFACTURE OF HALOSILYL ORGANIC COMPOUNDS AND NOVEL PRODUCTS MADE THEREBY

Robert A. Benkeser, and James M. Gaul, both of W. Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed March 10, 1970, Ser. No. 18,332

Int. Cl. C07f 7/08, 7/12

U.S. Cl. 260—448.2 R **21 Claims**

Novel process for producing halosilyl organic compounds by reacting a trihalosilane having one silicon-bonded hydrogen atom per molecule with a carboxylic organic compound under anhydrous conditions in the presence of a tertiary amine. A normally liquid organic solvent which does not chemically combine with the reactants or products of the process can be used.

Novel products produced by this process are p-bromophenylmethyltrihalosilanes and dialkylphenylmethyltrihalosilanes. The novel compounds are used to make resinous siloxanes useful as, for example, potting compositions.

3,699,144
AROMATIC POLYSULFITES

Colin G. Hull, San Francisco, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,557

Int. Cl. C07c 143/68

U.S. Cl. 260—456 P **4 Claims**

The disclosure describes novel compounds, the bis-chlorosulfinate of di-(monohydroxyaryl)alkanes, and a novel method for producing aromatic polysulfites from said bis-chlorosulfinates by heating the bis-chlorosulfinate under reduced pressure whereby the bis-chlorosulfinate undergoes self-polymerization to form an aromatic polysulfite.

3,699,145

FLUORINATED OXYGEN-CONTAINING PRODUCTS AND PROCESS FOR PREPARATION THEREOF

Dario Sianesi; Adolfo Pasetti, and Costante Corti, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 650,257, June 30, 1967, abandoned, which is a continuation-in-part of Ser. No. 446,292, April 7, 1965, Pat. No. 3,442,942. This application May 1, 1970, Ser. No. 31,852

Claims priority, application Italy, July 6, 1966, 15625 A/66; Dec. 16, 1966, 31193 A/66

Int. Cl. C07c *69/64*

U.S. Cl. 260—463 5 Claims

Perfluorinated cyclic ethers and fluorinated linear polyethers. Prepared by photochemical reaction in liquid phase of perfluoropropylene with oxygen in presence of ultraviolet radiation.

3,699,146

SYNTHESIS OF METHYL MALVALATE AND METHYL 5,6-METHANO-5-UNDECENOATE

Walter J. Gensler, Belmont, Mass., assignor to The United States of America as represented by the Secretary of Agriculture

Filed March 31, 1970, Ser. No. 24,338

Int. Cl. C07c *61/18, 121/48, 69/74*

U.S. Cl. 260—464 1 Claim

This invention relates to the preparation of methyl malvalate, methyl 5,6-methano-5-undecenoate and the preparation of some new intermediates. Malvalic acid, the major cyclopropene component in cottonseed oil, has been synthesized. When 1-chloro-7-hexadecyne reacts with diazoacetic ester in the presence of copper bronze, the ester of 1-chloro-7,8-carboxymethano-7-hexadecene is formed. Treating the corresponding acid chloride with zinc chloride causes loss of carbon monoxide. Either sodium borohydride or lithium aluminum hydride reduces the resulting cyclopropenium compound to 1-chloro-7,8-methano-7-hexadecene. Replacing the chloro group with cyano yields malvalonitrile, which can be converted to methyl malvalate. An analogous sequence of steps has been applied to 1-chloro-4-decyne to produce methyl 5,6-methano-5-undecenoate. An alternate synthesis of methyl malvalate starts by using 1-chloro-7-hexadecyne as the precursor for methyl 8-heptadecynoate. This acetylenic ester is converted to 8,9-carboxymethano-8-heptadecenoic acid, the diacid chloride of which decarbonylates selectively in the presence of metallic chlorides to form the cyclopropenium-acid chloride. After esterification the resulting cyclopropenium-ester is reduced with borohydride to methyl malvalate.

3,699,147

PROCESS FOR PREPARING NITRILES

Derk Th. A. Huibers, Berkeley Heights, and John J. Waller, Jersey City, both of N.J., assignors to The Lummus Company, New York, N.Y.

Division of Ser. No. 548,396, May 9, 1966, Pat. No. 3,528,932. This application April 4, 1969, Ser. No. 844,684

Int. Cl. C07c *121/02, 121/32, 121/50*

U.S. Cl. 260—465 C 8 Claims

A process for the production of a nitrile having three to 12 carbon atoms per molecule by contacting at a temperature of 400° to 500° C and a contact time of 10 to 0.1 seconds a gaseous mixture of hydrocarbons of three to 12 carbon atoms containing the group

$$H_3C—C_1=C_1—$$

and ammonia with an iron and arsenic containing catalyst having an atomic ratio of iron to arsenic of 1.1:1 to 10:1 prepared by adding an aqueous arsenate salt solution to an aqueous ferric salt solution, adjusting, the pH value of the resulting solution to between 0.5 and 6, evaporating and calcining the product.

3,699,148

PROCESS FOR THE SYNTHESIS OF 2-HYDROXY 4-METHYLTHIO BUTYRONITRILE

Claude Darcas; Raymond Jobert, and Charles Laviron, all of Saint-Avold, France, assignors to UGILOR, Paris, France

Filed Sept. 23, 1969, Ser. No. 860,432

Claims priority, application France, Sept. 24, 1968, 68167263

Int. Cl. C07c *121/34*

U.S. Cl. 260—465.6 10 Claims

A process, either continuous or intermittent, for the synthesis of 2-hydroxy 4-methylthio butyronitrile which comprises adding an amount of methyl mercaptan to a mixture of acrolein cyanohydrin and a basic agent, said basic agent being used in an amount such that the pH of a solution obtained by diluting said mixture twenty times with distilled water is maintained between 7 and 8, said methyl mercaptan being 5 to 50 percent in excess of the stoichiometric amount relative to the cyanohydrin. The excess mercaptan is eliminated and can be recycled or reused for the continuous or intermittent process respectively.

3,699,149

PHENYL ESTERS OF T-AMCHA

Yuichi Yamamura, Osaka; Setsuro Fujii, Tokushima-shi; Atsuji Okano; Miyoshi Hirata, both of Tokyo; Yasushi Abiko, Matsudo-shi; Masato Inaoka, Funabashi-shi; Reimei Moroi, Chiba-shi; Mashiro Iwamoto; Shoichi Funabashi, both of Tokyo, and Takeo Naito, Ichikawa-shi, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

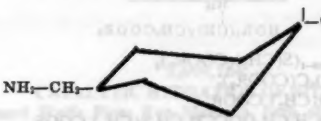
Filed Sept. 30, 1969, Ser. No. 862,512

Claims priority, application Japan, Oct. 14, 1968, 43/74220; Dec. 12, 1968, 43/90564

Int. Cl. C07c *69/74, 69/78*

U.S. Cl. 260—468 R 10 Claims

Compounds of the formula



having anti-plasmin activity have been prepared.

3,699,150

ETHERS OF DICARBOXYLIC ACIDS

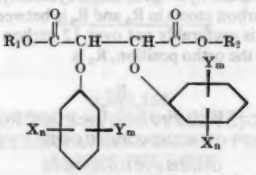
Delta W. Gier, Laurinburg, N.C., and Daniel M. Wasleski, Kansas City, Mo., assignors to Baychem Corporation, New York, N.Y.

Division of Ser. No. 675,350, Oct. 16, 1967, abandoned. This application May 22, 1970, Ser. No. 38,650

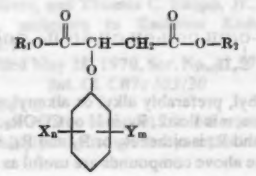
Int. Cl. C07c *79/46*

U.S. Cl. 260—471 R 11 Claims

Compounds of the formulas



and



where R_1 and R_2 are hydrogen, alkyl, chloroalkyl, phenyl and alkyl phenyl, X is halogen, Y is nitro, *m* is an integer from 1 to 2 and *n* is an integer of 1 to 3 are useful as herbicides and desiccants and to a lesser extent as defoliants. For the best desiccant properties there should be a halogen in the ortho position of the chloronitrophenyl group.

3,699,151

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Bruno Cavalieri, Via Pierlombardo 25, Milan; Elvio Bellasio, Piazza IV Novembre, Albate (Como), both of Italy; Emilio Testa, San Simone Vacallo, Ticino, Switzerland, and Giulio Maffii, Via Gioberti 2, Milan, Italy

Filed Aug. 5, 1968, Ser. No. 750,009

Claims priority, application Great Britain, Aug. 14, 1967, 37,197/67

Int. Cl. C07c *69/76*; C07d *5/44*

U.S. Cl. 260—473 R 2 Claims

A new class of derivatives of the ethyl ester of fluoroacetic acid is described and some methods for their preparation are reported. The compounds have a pharmacological interest, because of their marked antiinflammatory activity.

3,699,152

SULFUR CONTAINING ESTERS OF SUBSTITUTED HYDROXYPHENYL-ALKANOIC ACIDS

Ingenuin A. Hechenbleikner, Kenwood; John F. Hussar, Loveland; Arthur F. Koeniger, Cincinnati, and Robert E. Bresser, Sharonville, all of Ohio, assignors to Carlisle Chemical Works, Inc., Reading, Ohio

Filed Dec. 10, 1969, Ser. No. 884,016

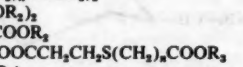
Int. Cl. C07c *65/04*

U.S. Cl. 260—473 S 14 Claims

Compounds are prepared having one of the following formulas:

a. $HOR_1CH_2S(CH_2)_nCOOR_4$

(b)



c. $HOR_1C_mH_{2m-1}(S(CH_2)_nCOOR_3)_2$

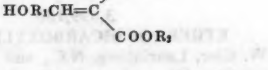
d. $(HOR_1CH_2)_2C(COOR_2)_2$

e. $HOR_1CH_2O(CH_2)_nCOOR_2$

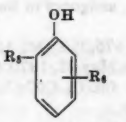
f. $HOR_1CH_2OCH_2CH_2OOCCH_2CH_2S(CH_2)_nCOOR_3$

g. $HOR_1CH_2CH(COOR_2)_2$

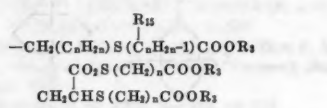
(h)



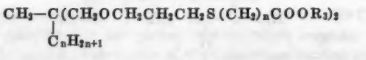
where HOR_1 is



where R_5 and R_6 are hydrogen, alkyl, cycloalkyl, aryl or aralkyl, the total carbon atoms in R_5 and R_6 is between four and 36 carbon atoms, is preferably not over 12 carbon atoms and R_6 is preferably in the ortho position, R_2 is



or



R_3 is hydrocarbyl, preferably alkyl or alkenyl, e.g., of one to 18 carbon atoms, *n* is 1 or 2, R_{14} is H or $COOR_2$, *m* is 1, 2, 3 or 4, *y* is 0 or 1, and R_4 is either R_2 or R_3 and R_{15} is hydrogen or lower alkyl. The above compounds are useful as antioxidants.

3,699,153

PREPARATION OF HYDROXYL TERMINATED POLYMERS

Alan R. Siebert, Maple Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 731,269, May 22, 1968, Pat. No. 3,551,472. This application July 2, 1970, Ser. No. 52,075

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 R 4 Claims

Hydroxyl terminated polymers, useful as adhesives and caulking materials, are prepared by the reaction of carboxyl terminated polymers with a diol in the presence of an acid catalyst.

3,699,154

REACTION PRODUCTS OF WAX-ANHYDRIDE COMPOUNDS AND ALCOHOL

William J. Heintzelman, and Michael I. Naiman, both of St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.

Division of Ser. No. 607,877, Jan. 9, 1967, Pat. No. 3,590,076, which is a continuation-in-part of Ser. No. 527,075, Feb. 14, 1966, abandoned. This application Jan. 18, 1971, Ser. No. 107,594

Int. Cl. C07c *69/40*

U.S. Cl. 260—485 J 2 Claims

Wax-anhydride compounds and derivatives thereof, including amides, esters, etc.; processes by which they are prepared; and uses thereof, including their use as carbon paper inks, polishes, etc.

3,699,155

SYNTHESIS OF ALLYL ESTERS WITH PALLADIUM AND PLATINUM HALIDE CATALYSTS

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 11, 1969, Ser. No. 849,183

Int. Cl. C07c *67/00*

U.S. Cl. 260—491 9 Claims

Preparation of allyl esters of carboxylic acids in improved yields by use of palladium and platinum halides as catalysts in the reaction between allyl halides and salts of carboxylic acids.

3,699,156

FLUORINATED CYCLIC ALCOHOL AND THEIR ESTERS

Dewey G. Holland, Allentown; Ronald C. Moyer, Sellersville; John H. Polevy, Allentown, and Robert A. Walde, Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 608,510, Jan. 11, 1967, Pat. No. 3,600,433. This application Jan. 24, 1968, Ser. No. 700,029

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 H 8 Claims

Perfluoro-cyclohexane carbonyl fluoride and perfluoro (alkyl cyclohexane) carbonyl fluorides, obtained by electrolytic fluorination, are converted to esters and reduced to the corresponding α, αdihydrocarbinol compounds. The fluorinated carbinol compounds are useful as textile treating agents, or these compounds as intermediates can be converted to polymerizable materials suitable for imparting oil and water repellency to textile fabrics and other surfaces. Examples describe the reaction of such polyfluorinated cyclic carbinols with acrylyl and methacrylyl halides to obtain these polymerizable monomers, and the formation of homopolymers, copolymers and segmented copolymers therefrom.

3,699,157

COLOR REDUCTION OF OLEFIN SULFONATES

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed April 6, 1970, Ser. No. 26,172
Int. Cl. C07c *143/16*
U.S. Cl. 260—513 R 5 Claims

Olefin sulfonates of improved color are obtained by contacting the olefin, prior to sulfonation, with molecular oxygen at an elevated temperature.

3,699,158

SELECTIVE DEUTERATION OF TYROSINE, ASPARTIC AND GLUTAMIC ACIDS

Irving Putter, Martinsville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 25, 1969, Ser. No. 852,926
Int. Cl. C07c *101/04*
U.S. Cl. 260—519 25 Claims

A method for the preparation of deuterated L-tyrosine, L-aspartic acid and L-glutamic acid which comprises treating protonated L-tyrosine, L-aspartic acid or L-glutamic acid or a suitable partially deuterated analog thereof with either a deuterated inorganic acid or an alkali metal deuteroxide or alkaline earth metal deuteroxide. The products thus obtained are useful as intermediates in the preparation and study of labelled peptides, polypeptides and proteins and as a growth medium for biological investigations.

3,699,159

1,3,5-TRIHYDROXY-2,4,6-BENZENE TRICARBOXYLIC ACID AND WATER SOLUBLE SALTS THEREOF

Daniel S. Connor, and Harry Karl Krummel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 28, 1970, Ser. No. 102,049
Int. Cl. C07c *65/04*
U.S. Cl. 260—521 R 4 Claims

Novel compounds are provided which are 1,3,5-trihydroxy-2,4,6-benzene tricarboxylic acid and salts thereof. These compounds are useful sequestering agents.

3,699,160

PURIFICATION OF PHENYLINDANE CARBOXYLIC ACIDS BY PERMANGANATE TREATMENT OF THE SODIUM SALTS

Alfred Steitz, Jr., Flossmoor, Ill., assignor to The Standard Oil Company, Chicago, Ill.

Filed March 27, 1968, Ser. No. 716,335
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 5 Claims

Phenylindane carboxylic acids are purified by low concentration permanganate treatment at pH upward from 10 and carbon treatment to remove at least manganous ions. The process is particularly useful for the purification of phenylindane dicarboxylic acids that are to be converted to the beta hydroxy alkyl esters from which corresponding film and fiber forming polyesters are made.

3,699,161

PROCESS FOR THE PRODUCTION OF THIOPHOSGENE

Helmut Magerlein, Erlenbach; Gerhard Meyer, Obernburg, and Hans-Dieter Rupp, Erlenbach, all of Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed April 15, 1971, Ser. No. 134,495
Claims priority, application Germany, April 17, 1970, P 20 18 381.7
Int. Cl. C07c *51/58*
U.S. Cl. 260—543 R 10 Claims

Process of producing thiophosgene by reduction of trichloromethanesulfenyl chloride with hydrogen sulfide on silica gel at 120°–180°C., preferably 130°–160° C.

3,699,162

REACTION OF PHOSGENE AND CYANOGEN CHLORIDE

Hermann Hagemann, Cologne, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 731,284, May 22, 1968, Pat. No. 3,600,439. This application Dec. 15, 1969, Ser. No. 884,895
Claims priority, application Germany, Jan. 7, 1969, P 19 00 542.6The portion of the term of this patent subsequent to Aug. 17, 1988, has been disclaimed.
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 C 3 Claims

Phosgene and cyanogen chloride are reacted under pressure in the liquid phase over an activated charcoal catalyst at 100° to 250° C to produce a mixture of chlorocarbonylisocyanide and carbonyl-bis-(N-isocyanide dichloride).

3,699,163

N-SUBSTITUTED CARBAMOYL CHLORIDES AND METHOD OF PREPARATION

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 12, 1970, Ser. No. 45,901
Int. Cl. C07c *51/58, 53/30*
U.S. Cl. 260—544 C 8 Claims

N-alkyl-N-chlorothiocarbamoyl chlorides and their method of preparation by reacting alkyl isocyanates with sulfur dichloride. The carbamoyl chlorides are useful intermediates in the preparation of pesticides.

3,699,164

CATALYTIC HYDRATION OF NITRILES

Leonard Wolfe Fine; Ken Matsuda, both of Stamford, and James Mitchell Photis, Ridgefield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 13, 1970, Ser. No. 19,468
Int. Cl. C07c *103/08*
U.S. Cl. 260—561 N 6 Claims

A catalytic process for hydration of a nitrile, e.g. acrylonitrile, with water in presence of a manganese dioxide catalyst is operated to obtain improved conversion and longer catalyst life by carrying out the reaction in dilute aqueous solution of a strong acid, e.g. in aqueous solution of HNO_3 or HCl at pH below 3.0. The product is the amide, e.g. acrylamide.

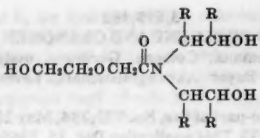
3,699,165

N,N-BIS[2-HYDROXYALKYL]-2-HYDROXYETHOXYACETAMIDE AND PROCESS FOR MAKING THE SAME

Kenneth H. Albers, and Thomas C. Snapp, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1970, Ser. No. 41,576
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 B 12 Claims

This invention relates to novel trioletheramides, i.e. N,N-bis[2-hydroxyalkyl]-2-hydroxyethoxyacetamide, having the formula



wherein each R is a member selected from the group consisting of hydrogen, methyl, and ethyl, and to a method of preparing said trioletheramides from 2-p-dioxanone and a non-heterocyclic secondary amine, preferably at a temperature of less than 60° C.

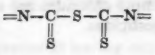
3,699,166

PROCESS FOR FORMING CARBAMYL THIOCARBAMYL DISULFIDES

Alan R. Parkinson, Harwood, near Bolton, England, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed April 22, 1970, Ser. No. 30,953
Int. Cl. C07c *153/05*
U.S. Cl. 260—567 **9 Claims**

The process for forming carbamyl thiocarbamyl disulfides and related compounds by passing a molecular oxygen oxidizing agent through a liquid reaction medium such as water, containing a thiuram monosulfide including the following structural formula



and catalytic amounts of nitrous acid. These compounds may be utilized as vulcanization accelerators.

3,699,167

1-ALKYL-4-BIS(HALOALKYL)AMINO-3,5-DINITROBENZENE

Donald W. Kaiser, New Haven, Conn., assignor to The Ansul Company, Marinette, Wis.

Filed Nov. 17, 1969, Ser. No. 877,507
Int. Cl. C07c *87/60*
U.S. Cl. 260—577 **4 Claims**

Novel 1-alkyl-4-bis(halogenoalkylene)amino-3,5-dinitrobenzene and 1-alkyl-4-bis(hydroxyalkylene)amino-3,5-dinitrobenzene derivatives are disclosed as well as the use of the halogenated compounds as pre-emergent herbicides for the elimination of broadleaf weeds and grasses. The hydroxyalkylene compounds serve as useful intermediates in the preparation of the corresponding halogenated derivatives which are active pre-emergent herbicides.

3,699,168

PREPARATION OF CERTAIN DIFLUOROAMINO COMPOUNDS

William H. Gilligan, and William E. McQuistion, both of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 26, 1967, Ser. No. 679,289
Int. Cl. C07c *87/22, 83/00*
U.S. Cl. 260—583 NH **9 Claims**

A method for providing tris(difluoroamino)alkanes which comprises reacting difluoroamine with an unsaturated carbonyl containing compound in the presence of a catalytic amount of toluene sulfonic acid and reacting the product so formed with additional amounts of difluoroamine in the presence of a catalytic amount of concentrated sulfuric acid.

3,699,169

PROCESS FOR PREPARATION OF TERPENE FLAVORANTS

Erhard Bertele, Dubendorf, and Peter Schudel, Grut near Wetzikon, both of Switzerland, assignors to Givaudan Corporation, Delawanna, N.J.

Filed Sept. 5, 1968, Ser. No. 757,772
Claims priority, application Switzerland, Sept. 15, 1967, 13041/67
Int. Cl. C07c *45/04*
U.S. Cl. 260—604 R **2 Claims**

A process for preparing sinensal by the ozonization of beta farnesene and reduction of the ozonolysis product to obtain sinensal, which is suitable as a flavor-inparting agent of orange aroma.

3,699,170

DIMETHYL SULFOXIDE-SULFUR TRIOXIDE COMPLEX

Roy L. Whistler, Wabash Township, Tippecanoe County, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Division of Ser. No. 635,663, May 3, 1967, Pat. No. 3,507,855, which is a continuation-in-part of Ser. No. 575,982, Aug. 30, 1966, abandoned. This application July 22, 1969, Ser. No. 871,087
Int. Cl. C07c *142/02*
U.S. Cl. 260—607 D **1 Claim**

A sulfur trioxide-dimethyl sulfoxide complex containing from 1 to about 3 moles of dimethyl sulfoxide for each mole of sulfur trioxide.

3,699,171

PROCESS FOR THE OXIDATION OF ARYL ALKYL SULFOXIDES TO ARYL ALKYL SULFONES

John L. Sanderson, Medford, Oreg., and Edward W. Swift, Denver, Colo., assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 28, 1970, Ser. No. 68,040
Int. Cl. C07c *147/06*
U.S. Cl. 260—607 A **14 Claims**

An aryl alkyl sulfone is produced by reacting a corresponding aryl alkyl sulfoxide with a nitrogen oxide in the presence of sulfuric acid and molecular oxygen.

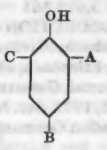
3,699,172

HYDROXYMETHYL, METHYLTHIO PHENOLS

Merle E. Cisney, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Nov. 28, 1969, Ser. No. 880,908
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F **2 Claims**

A substituted phenol having anti-oxidant properties. The phenol is substituted according to the formula



wherein A is a hydroxyalkyl having from one to about three carbon atoms, B is alkylthio having from one to about 12 carbon atoms and C is hydrogen or alkyl up to 12 carbon atoms.

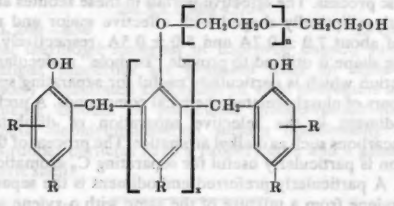
3,699,173

EMULSIFIABLE POLYMERIC HINDERED PHENOLS AND THEIR USE AS STABILIZERS

Edward V. Osberg, Andover, and Walter Beck, Bedford, both of Mass., assignors to Stepan Chemical Company, Wilmington, Mass.

Filed March 22, 1971, Ser. No. 126,917
Int. Cl. C07c 43/26
U.S. Cl. 260—613 B 8 Claims

Water-emulsifiable hindered polymeric phenols particularly used as stabilizers in polymeric latex compositions are prepared by condensing a hindered phenol with a water-soluble or water-emulsifiable phenolic compound. Typical polymeric hindered phenols are ethoxylated polymeric alkyl-hindered phenols having the structure:



wherein R represents an ortho C_4-C_{12} alkyl group, n is a number from 10 to 80 and x is 1, 2 or 3. Such ethoxylated polymeric hindered phenols are prepared by polymerizing a dialkyl hindered phenol with ethoxylated alkyl phenol employing formaldehyde in an acid medium.

3,699,174

PROCESS FOR PREPARING DIALKOXYALKANES

Takashi Koyano, Iruma-gun, and Saburo Fukushi, Tokyo, both of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 691,151, Dec. 18, 1967, abandoned. This application July 28, 1969, Ser. No. 845,542
Claims priority, application Japan, Feb. 8, 1967, 42/8098
Int. Cl. C07c 43/00
U.S. Cl. 260—615 R 5 Claims

A process for producing dialkoxyalkanes by reacting a dihaloalkane with an aliphatic alcohol in the presence of at least one metal or metallic compound selected from the group consisting of metals and metallic compounds of Groups I–V and transition metals of Groups VI–VIII of the Periodic Table.

3,699,175

HYDROXYLATION OF AROMATICS

James Coyle, El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,846
Int. Cl. C07c 37/00
U.S. Cl. 260—621 G 2 Claims

Aromatic hydroxyl compounds are produced by the direct transfer of oxygen from a metal ion-enediol-oxygen complex to aromatic hydrocarbons in the presence of metal ion chelating agents in a solvent under controlled conditions of hydrogen ion concentration.

3,699,176

PROCESS FOR RECRYSTALLIZING HEXANITROSTILBENE

Leroy J. Syrop, Sepulveda, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Oct. 2, 1970, Ser. No. 77,653
Int. Cl. C07c 79/10
U.S. Cl. 260—645 6 Claims

An improved apparatus and process is provided for processing the explosive known as Hexanitrostilbene (HNS) from a form known as HNS-I into a form known as HNS-II, to provide a refined product with a unique crystal form so as to facilitate handling of the material. The process of the invention involves an improved extraction technique involving the use of a solution of acetonitrile in which HNS-I is soluble and xylene in which HNS is insoluble for refining the HNS-I into an improved type of HNS-II.

3,699,177

PREPARATION OF HALOGENATED AROMATIC COMPOUNDS

Lewis William Watts, and Philip H. Moss, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 3, 1969, Ser. No. 873,643
Int. Cl. C07c 25/00, 25/18
U.S. Cl. 260—649 D 1 Claim

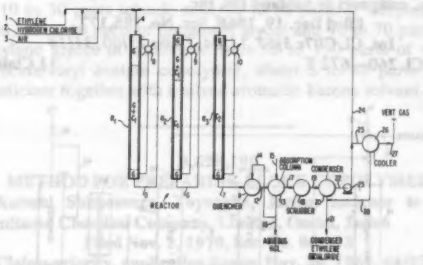
A process for preparing halogenated aromatic compounds by a direct vapor phase reaction of a halogen and an aromatic compound in an open tube in the absence of catalyst. Halogenated aromatic compounds are useful as electrical insulators, additives in lubricants, as fire resistant heat transfer and hydraulic fluids, and constituents in elastomers, adhesives, paints, and waxes.

3,699,178

OXYCHLORINATION PROCESS

Yoshitaka Suzuki; Atsushi Takenoue, and Hideo Kojima, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1968, Ser. No. 704,662
Claims priority, application Japan, June 23, 1967, 42/39936
Int. Cl. C07c 17/02, 17/04
U.S. Cl. 260—659 A 7 Claims



In a process for the oxychlorination of a hydrocarbon, such as ethylene using Deacon catalyst containing copper chloride in a fixed catalyst bed system, the temperature distribution can be uniformly maintained throughout the catalyst bed and the selectivity of the reaction can be increased by arranging the catalyst bearing carrier particles in such a manner that the size of the particles in the reactor at the inlet side of feed gases is larger than that of the particles at the outlet side of product gases.

3,699,179

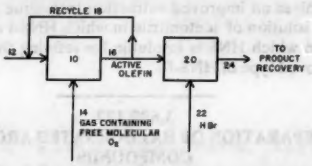
HYDROBROMINATION OF ALPHA-OLEFINS

John P. Boyle, Moon Township, Allegheny County; Clarence R. Murphy, Allison Park, and William L. Walsh, Glenshaw, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 9, 1969, Ser. No. 856,260
Int. Cl. C07c 17/08
U.S. Cl. 260—663 9 Claims

A method is provided for reducing the air-blowing time required to activate a substantially pure alpha-olefin for reac-

tion with anhydrous hydrogen bromide to produce a primary alkyl bromide. The method involves admixing at least four



weight percent of a previously activated alpha-olefin with the substantially pure alpha-olefin prior to air-blowing.

3,699,180

ISOMERIZATION OF DIHYDRONAPHTHALENES

David R. Waywell, Lisle, Ill., and Charles T. West, Manhattan, Kans., assignors to Standard Oil Company, Chicago, Ill.

Filed May 26, 1971, Ser. No. 147,269
Int. Cl. C07c *15/24*
U.S. Cl. 260—668 F **6 Claims**

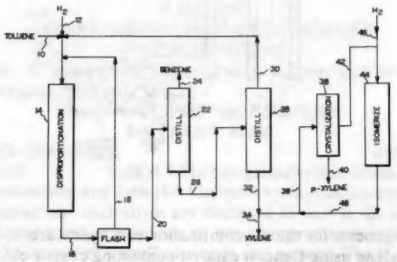
An improved method for conversion of 1,4-dihydronaphthalene to the corresponding 1,2-dihydro isomer employs as catalyst an alkali metal hydroxide in a polar solvent, preferably isopropyl alcohol. At moderate temperatures, ranging from 60° to 100° C., the 1,2-dihydro isomer is obtained directly in sufficient purity for use in the synthesis of polymers and plastic materials.

3,699,181

ALKYL TRANSFER OF ALKYL AROMATICS WITH GROUP VIB METALS ON MORDENITE

Ronald A. Kmecak, and Stephen M. Kovach, both of Ashland, Ky., assignors to Ashland Oil, Inc.

Filed Dec. 19, 1968, Ser. No. 785,177
Int. Cl. C07c *3/62, 11/04*; C10g *23/00, 31/14*
U.S. Cl. 260—672 T **11 Claims**



A process for the alkyl transfer of alkyl aromatics including contacting an alkyl aromatic feed material, such as toluene, with a catalyst comprising a Group VIB metal, such as chromium, molybdenum and tungsten deposited on a synthetic mordenite base at a temperature of about 700° to 1,100° F, a pressure of about 0 to 2,000 psig, and a liquid hourly space velocity of about 0.1 to 10, and in the presence of hydrogen introduced at a rate of about 1 to 10 moles hydrogen per mole of hydrocarbon feed. Promoters selected from Group I, Group II, Group IV, and the Rare Earth metals of the Periodic System may be added to the catalyst. Deactivated catalyst may be periodically rejuvenated by discontinuing the introduction of aromatic feed material and purging with hydrogen and the catalyst can be reactivated by calcination in an inert atmosphere such as air. Where toluene is the feed, the alkyl transfer product may be distilled to separate benzene, toluene and xylenes, the toluene may be recycled to the alkyl transfer step, the xylenes may be crystallized to separate para-xylene from the remaining xylenes, the mother liquor from the crystallization step may thereafter be isomerized to readjust the para-xylene content and the product of the isomerization may be recycled to the crystallization zone.

3,699,182

SELECTIVE SEPARATION BY A CHROMATOGRAPHIC PROCESS

John Cattanach, Glassboro, N.J., assignor to Mobil Oil Corporation

Filed Dec. 5, 1969, Ser. No. 882,692
Int. Cl. C07c *7/12*
U.S. Cl. 260—674 SA **11 Claims**

A class of novel crystalline aluminosilicates generally identified as ZSM–5 type and having unique molecular sieving properties are utilized as selective sorbents in a chromatographic process. The effective portals in these zeolites are apparently elliptically shaped with effective major and minor axis of about 7.0 ± 0.7A and 5.0 ± 0.5A, respectively. This unique shape is utilized to provide "keyhole" molecular sieving action which is particularly useful for separating specific members of closely-related chemical compounds. A preferred embodiment is the selective separation of disubstituted hydrocarbons such as dialkyl aromatics. The process of this invention is particularly useful for separating C_8 aromatic mixtures. A particularly preferred embodiment is the separation of p-xylene from a mixture of the same with o-xylene and/or m-xylene and/or ethylbenzene.

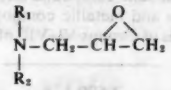
3,699,183

HIGH MOLECULAR WEIGHT POLYAMIDES WITH AN IMPROVED AFFINITY FOR ACID DYES MODIFIED WITH AMINO EPOXY COMPOUND

Karl-Heinz Hermann, Krefeld-Bockum; Schneider, Joachim, Krefeld-Uerdingen; Hans Rudolph, Krefeld-Bockum, and Gunter Nawrath, Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 23, 1970, Ser. No. 5,367
Claims priority, application Germany, Feb. 1, 1969, P 19 05 102.6
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 L **1 Claim**

Modified high-molecular weight polyamides having chemically incorporated therein 0.01 to 10 percent by weight of a basic monoepoxy compound of the general formula:



wherein R_1 and R_2, which may be different or not, each represents a C_1–C_{20} aliphatic radical selected from the group consisting of an unsubstituted radical and a substituted radical containing functional groups inert to polyamides, a cycloalkyl radical, a benzyl radical, or R_1 and R_2, together with the nitrogen atom to which they are attached, form a heterocyclic ring; are provided which polyamides show an improved affinity for acid dyes.

3,699,184

BLEND OF BLOCK COPOLYMER, ONE OF WHICH IS EPOXIDIZED

Glenn L. Taylor, Houston, Tex.; John W. Cotton, Palos Verdes Peninsula, and De Loss E. Winkler, Orinda, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 759,521, Sept. 12, 1968, Pat. No. 3,607,977. This application June 16, 1071, Ser. No. 153,835
Int. Cl. C08g *45/04*; C08f *15/00, 19/00*
U.S. Cl. 260—836 **5 Claims**

Block copolymer compositions are provided comprising hydrocarbon block polymer containing at least two monoalke-

nyl arene blocks and at least one conjugated diene block or hydrogenated derivatives of said polymers, combined with a second block copolymer comprising at least one monoalkenyl polymer block and at least one epoxidized conjugated diene polymer block and hydrogenated derivatives thereof. These compositions are especially useful for such purposes as adhesion to polar surfaces, improvement in weatherability and high tensile strength.

3,699,185

RUBBER-MODIFIED ACRYLIC COPOLYMER THERMOSET

Ray A. Dickie, Pleasant, and Santokh S. Labana, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1970, Ser. No. 100,468
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 13 Claims

Novel thermoset materials of improved impact, strength and fatigue properties are prepared from an alpha-beta olefinically unsaturated copolymer of vinyl monomers and a crosslinking amount of particulate graded-rubber having alpha-beta olefinicunsaturation surface functionality. The graded-rubber particles have a rubbery core and a glass-like polymeric shell.

3,699,186

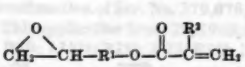
POLYOLEFINS MODIFIED WITH UNSATURATED GLYCIDYL COMPOUNDS AND POLYACRYLATE COMPOUNDS

Albert Schrage, East Orange, and Philip D. Readio, Sparta, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed March 30, 1971, Ser. No. 129,629
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 8 Claims

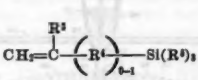
In modified polyolefin compositions prepared by reacting an olefin polymer with a polymerizable compound generally defined by

(I)



or

(II)



in the presence of an organic peroxide the melt flow may be controlled by including in the reactants a modifier comprising acrylic or methacrylic esters of diols or triols. The reaction product is particularly suitable for being reinforced with filamentary material such as glass fibers or asbestos or as a coating on metallic surfaces.

3,699,187

HOT MELT ADHESIVES COMPRISING TO ALIPHATIC DICARBOXYLIC ACID MODIFIED PHTHALIC ACID POLYESTER MIXTURES

Arno Gardziella, Witten-Rudinghausen, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 8, 1970, Ser. No. 96,236
Claims priority, application Germany, Dec. 13, 1969, P 19 62 642.7
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 4 Claims

A polyester-containing hot-melt adhesive for the bonding of materials, based on a phthalic acid, an aliphatic C_8 to C_{12} dicarboxylic acid, and a glycol with from two to 10 carbon atoms in the radical between the two OH groups, comprising

a. about 20 to 95 wt. percent of a polyester wherein about 5 to 20 mole percent of the dicarboxylic acid component comprises an aliphatic dicarboxylic acid, the polyester having a melting point of over about 150° C, and
b. about 5 to 80 wt. percent of a polyester wherein about 25 to 35 mole percent of the dicarboxylic acid component comprises an aliphatic dicarboxylic acid, the polyester having a melting point between about 50 and 150° C.

3,699,188

FIRE RESISTANT POLYMERS

Yutaka Kodama; Tsutomu Kodama, both of Toyama; Masao Nakabayashi, Namerikawa, and Shigekazu Komatu, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed March 31, 1970, Ser. No. 24,345
Claims priority, application Japan, May 19, 1969, 44/38023
Int. Cl. C09k *3/28*
U.S. Cl. 260—865 3 Claims

Novel organic phosphorosilicon compounds are silicate of α-hydroxyphosphonate prepared by reacting a phosphorous acid triester, a carbonyl compound and a silicon compound containing at least one active chlorine atom and are effective as flame-retarding agent for inflammable high polymers, particularly synthetic resins, synthetic rubbers and paints.

3,699,189

POLYESTER-VINYL CHLORIDE COPOLYMER ADHESIVE

Raymond E. Downey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 10, 1969, Ser. No. 875,577
Int. Cl. B32b *27/08*, *27/10*; C08g *39/10*
U.S. Cl. 260—873 2 Claims

A laminating adhesive is claimed containing a copolyester of 10 to 30 parts sebacic acid, 40 to 70 parts of terephthalic acid, 20 to 40 parts of neopentyl glycol and 40 to 70 parts of ethylene glycol in admixture with 50 to 150 parts of vinyl chloride/vinyl acetate copolymer, about 5 to 40 parts of a plasticizer together with a mixed aromatic-ketone solvent.

3,699,190

METHOD FOR PREPARING BLOCK COPOLYMER

Takatoshi Shimomura, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 2, 1970, Ser. No. 86,353
Claims priority, application Japan, Nov. 20, 1969, 44/93439
Int. Cl. C08f *15/02*, *19/04*, *45/68*
U.S. Cl. 260—877 16 Claims

A block copolymer composed of a polymer block of an anionically polymerizable conjugated vinyl compound and a polymer block of a coordination-anionically polymerizable monomer is produced by polymerizing a conjugated vinyl compound giving a stable carbanion, such as for example, a monovinyl aromatic compound, a vinylpyridine, a methacrylic acid ester, a vinylketone, or a conjugated diene, in a solvent using as a catalyst an alkali metal, an organo-lithium compound or an aromatic hydrocarbon-alkali metal complex, thereby obtaining a living polymer, treating the said living polymer with a metal halide or an organometallic halide represented by the general formula, $MR_{p-n}X_n$ (wherein M is a metal of Group II or III of Mendeleev's Periodic Table, R is a hydrocarbon residue having one to 20 carbon atoms, X is a halogen atom, p is the valency of M, and n is an arbitary number of higher than 0 but lower than 3 to synthesize a polymer containing on its chain end(s) a linkage of carbon to a metal of Group II or III of Mendeleev's Periodic Table, and then contacting a coordination-anionically polymerizable monomer with a catalyst consisting of the above-mentioned polymer and a compound of a transition metal of Group IV, V or VI of Mendeleev's Periodic Table.

Block copolymers obtained according to the above-mentioned process are white powders and can be made into various molded and shaped articles by use of such thermoplastic resin-processing means as injection molding, compression molding, blow molding, fiber extrusion or film extrusion means.

3,699,191

PROCESS FOR BLACK COPOLYMERIZATION OF POLAR MONOMERS WITH AN ORGANOLITHIUM COMPOUND AND HETEROCYCLIC SULFUR COMPOUND

Theodore F. Niemann, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 862,961, Oct. 1, 1969, Pat. No. 3,609,100. This application Feb. 17, 1971, Ser. No. 116,236
Int. Cl. C08f *15/38, 15/16, 15/22*
U.S. Cl. 260—881 7 Claims

Polar monomers can be polymerized to obtain block copolymers by the sequential addition of the polar monomers. The polymerization is initiated with an organolithium compound in combination with a heterocyclic compound containing a sulfur heteroatom. Acrylonitrile, methacrylonitrile and alkyl acrylates and methacrylates are copolymerized to two- and three-block copolymers with an initiator system consisting of an alkyl lithium compound and a five- or six-membered heterocyclic compound or fused heterocyclic ring system derived therefrom, where the heteroatom is sulfur which may be unsubstituted or contain one or two oxygen atoms bonded thereto but external to the ring.

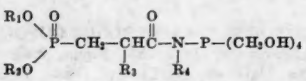
3,699,192

PHOSPHONIUM COMPOUNDS

Peter A. Moretti, Cranston, R.I., assignor to U.S. Oil Company, Incorporated, East Providence, R.I.

Filed Oct. 20, 1970, Ser. No. 82,496
Int. Cl. C07f *9/38*; D06m *1/100*; A01n *9/36*
U.S. Cl. 260—926 7 Claims

A di lower alkyl phosphite acrylamide or methacrylamide, preferably with formaldehyde and tetrakis (hydroxymethyl) phosphonium halide are reacted to form a compound of the formula



where R_1 and R_2 are lower alkyl R_3 is hydrogen or methyl and R_4 is hydrogen or methylol. The compounds are useful as fire retardants, particularly in textiles, paper and other forms of cellulosic fibers as well as synthetic fibers.

3,699,193

PROCESS FOR PREPARATION OF DIALKYL VINYL PHOSPHATES

Thomas M. Melton, Richmond, Va., assignor to Mobil Oil Corporation

Filed July 9, 1969, Ser. No. 840,490
Int. Cl. C07f *9/08*
U.S. Cl. 260—969 4 Claims

In the preparation of dialkyl vinyl phosphates from trialkyl phosphites, the use of a selective saturated aliphatic hydrocarbon solvent reaction medium in which the reactants and product are soluble at reaction temperature, but in which the product is insoluble at lower temperatures enables isolation of the product by cooling and separation. Higher yields of vinyl phosphates from trialkyl phosphites are obtained, and time consuming product recovery distillation procedures are not required. Temperature conditions for the process of this invention fall within the range of 50° C to 200° C.

3,699,194

PROCESS FOR THE PRODUCTION OF DIMETHYL 1-METHYL-2-(METHYLCARBAMOYL) VINYL PHOSPHATE

George W. Gaertner, Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,705
Int. Cl. C07f *9/08*
U.S. Cl. 260—969 4 Claims

Improved production of dimethyl 1-methyl-2-(methylcarbamoyl)vinyl phosphate by the reaction of 2-chloro-N-methylacetoacetamide with trimethyl phosphite, results from conducting the reaction in the presence of a poly-halogenated lower alkane.

3,699,195

PRODUCTION OF DIESTERS OF 2-HYDROXYETHYLPHOSPHONIC ACID

David I. Randall, and Calvin Vogel, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Aug. 7, 1969, Ser. No. 848,340
Int. Cl. C07f *9/38, 9/40*
U.S. Cl. 260—970 11 Claims

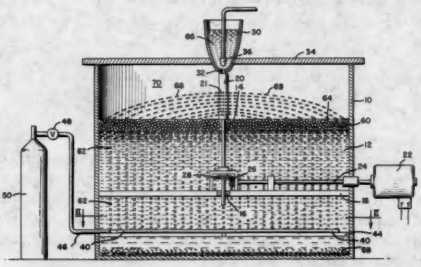
Process for the production of diesters of 2-hydroxyethylphosphonic acid by reaction of alkali metal salts of secondary phosphites and ethylene oxide wherein the reaction is conducted in the presence of an aprotic, dipolar solvent in which the dipole moment of the solvent is 3.5 Debye units or greater. Such diesters are useful as intermediates for the production of the plant stimulant 2-chloroethylphosphonic acid.

3,699,196

PARTICLE CASTING

John Frederick Joyce, Columbus, Ohio, and T. Stevens Daugherty, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 560,462, June 27, 1966, abandoned. This application Jan. 19, 1970, Ser. No. 4,144
Int. Cl. B22f *9/00*
U.S. Cl. 264—6 2 Claims



In a process of cooling and solidifying molten metal particles, gas substantially free from nascent and molecular oxygen (argon, helium, nitrogen, carbon dioxide and carbon monoxide) is bubbled through a liquid, thereby creating at the surface of the liquid a layer of foam of bubbles containing some of the gas. Additional gas is retained in the space adjacent the foam. Molten metal particles are formed by being centrifugally projected through holes extending through a side wall of a rotating pot disposed within the space. The molten particles are decelerated and cooled by passing into said foam, and rupture some of the bubbles, so that the gas contained within them flows into the space. The particles then leave the foam and pass into the liquid, becoming further cooled, and are thereafter recovered solidified, substantially unoxidized, and

with a minimum of distortion, thereby being suitable for forming into strip. New gas-containing bubbles are created by bubbling additional gas through the liquid, so as to maintain the layer of foam.

3,699,197

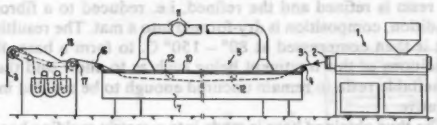
METHOD OF PRODUCING RUBBER PROFILES

Georg M. Egger, Kirchstrasse 144, 3084 Wabern, Switzerland

Continuation-in-part of Ser. No. 105,112, Jan. 8, 1971, Continuation of Ser. No. 773,745, Nov. 6, 1968, abandoned. This application April 20, 1971, Ser. No. 135,590

Int. Cl. B29c *17/02*; B29n *5/01*

U.S. Cl. 264—40 5 Claims



Method for the production of rubber profiles of predetermined cross-sectional dimensions by subjecting a vulcanizable rubber profile in the form of a continuous length to stretching, then feeding the stretched profile to a liquid heating medium to vulcanize the rubber and fix the desired cross-sectional dimensions, while automatically adjusting the speed of withdrawal of the profile from the liquid medium into relation to the feeding speed thereinto so as to maintain a substantially constant radio of withdrawal speed to feeding speed.

3,699,198

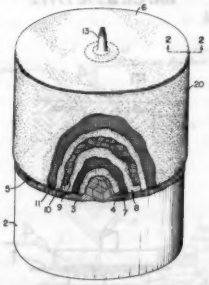
METHOD OF MAKING SHAPED ARTICLES

Keith D. Robinson, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 751,018, June 19, 1968, abandoned, which is a continuation of Ser. No. 379,078, June 30, 1964, abandoned. This application Sept. 29, 1969, Ser. No. 863,014

Int. Cl. B29c *13/04*; B29h *7/03*; B32b *27/12*, *27/40*

U.S. Cl. 264—96 1 Claim



This invention relates to a method of making an article having a plane of symmetry whereby a portion of the article is used as the form for building the second part of the article and the material used to build the article is a polyurethane reaction mixture, including a method of attaching fittings to said article during construction by releasably attaching the fitting to one surface of the article.

3,699,199

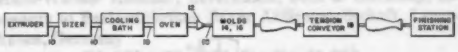
CONTINUOUS BLOW MOLDING PROCESS WITH REDUCTION OF LENGTH COMPENSATION

Richard MacDuff, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 30, 1970, Ser. No. 102,694

Int. Cl. B29c *17/07*, *7/00*

U.S. Cl. 264—99 7 Claims



In a continuous blow molding operation, mold release of the newly formed container is facilitated by providing a conveyor adjacent to the point where the mold opens. The newly formed container is connected at one end by waste material to a previously formed container that is in the conveyor and is connected at the other end to material in a closed mold behind the mold that is opening. The conveyor haul off speed and the speed of the molds are at a relative rate which maintains a certain tension in the waste material between the previously formed container and the newly formed container and there is also tension in the material between the two molds. This tension facilitates mold release of the newly formed container upon opening of the mold. The speed of the molds is greater than the haul off speed of the conveyor by a rate which is substantially equal to the rate of reduction of length in the material between the previously formed container and the closed mold to prevent any deformity in the containers due to an excess of tension.

3,699,200

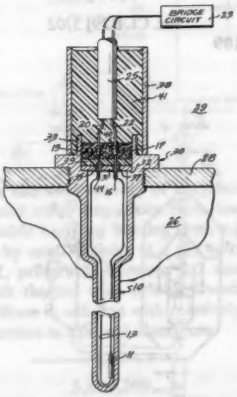
HIGH-RESISTANCE ELECTRICAL CONDUCTOR ENCAPSULATION

Richard D. Tokarz, and Joseph E. Kaveckis, both of Richland, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed March 19, 1970, Ser. No. 20,968

Int. Cl. B29d *3/00*

U.S. Cl. 264—102 1 Claim



A structure for encapsulating a connector assembly so as to provide a very high resistance between the conductors and between the conductors and ground is provided. The encapsulating structure includes a combination of at least two layers of epoxy resins with at least one layer having a dehydrating agent.

3,699,201

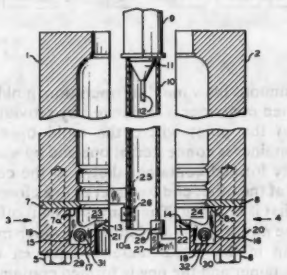
CUTTING AND SEALING PLASTIC TUBES

Edward W. Turner, Deerfield, Mass., assignor to Phillips Petroleum Company

Division of Ser. No. 595,910, Nov. 21, 1966, Pat. No. 3,478,388. This application June 27, 1969, Ser. No. 837,128The portion of the term of this patent subsequent to July 2, 1985, has been disclaimed.

Int. Cl. B29c *17/07, 17/10*

U.S. Cl. 264—98 4 Claims



In a blow molding operation wherein a thermoplastic parison is closed off at one end and thereafter expanded by the introduction of internal fluid pressure to conform to a mold, the tube is sealed and severed by simultaneously forcing the walls of the tube together along at least three different paths which converge toward a central point. This sealing means is particularly useful in sealing thermoplastic parisons which have been cooled and thereafter reheated to a temperature near but below the crystalline melting point of the thermoplastic material.

3,699,202

MANUFACTURE OF PRESSED BOARDS

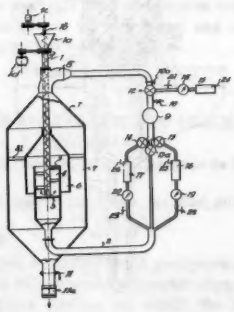
Jean-Baptiste Verbestel, Van Maerlantstraat, Kortryk, Belgium

Continuation-in-part of Ser. No. 806,217, March 11, 1969, abandoned. This application Aug. 3, 1970, Ser. No. 60,515

Claims priority, application Belgium, March 19, 1968, 56 030

Int. Cl. B29j *5/02*

U.S. Cl. 264—109 7 Claims



Gaseous reactive or polymerizable compounds and a gaseous catalyst are incorporated into lignocellulosic particles or fibers, and the compounds are reacted or polymerized in the presence of the catalyst to form a binder during hot pressing of the particles or fibers to form a board.

3,699,203

PROCESS FOR PRODUCTION OF MATRIX MOLDING BOARD

Keiji Oshima, Toyonaka; Shozo Yamada, Chigasaki; Fujio Sakurai, Fujisawa; Yoshisuke Iwasa, Sagamihara; Koichi Horiuchi; Unosuke Uchida, both of Yokohama; Teruhiko Nomura, Kamakura, and Yasushi Tominaga, Yokohama, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Feb. 10, 1970, Ser. No. 10,268

Claims priority, application Japan, Feb. 15, 1969, 44/10786; Feb. 15, 1969, 44/10788; Feb. 15, 1969, 44/10787; Dec. 27, 1969, 44/10844; Dec. 27, 1969, 44/10845; Dec. 27, 1969, 44/10846; Dec. 27, 1969, 44/10847

Int. Cl. D04h *1/60*

U.S. Cl. 264—112 8 Claims

A mixture comprising fibrous materials and a thermosettable resin is refined and the refined, i.e. reduced to a fibrous condition, composition is dry-formed into a mat. The resulting mat is then compressed at 80° – 150° C. to form a base, the conditions of this treatment being such as to allow said thermosettable resin to remain uncured enough to be molded into a matrix.

The thus obtained base is made into a matrix molding board by coating over the base a molding mixture prepared from a thermosettable resin and a filler. On the other hand, the surface layer of matrix molding board may be made by sprinkling the powdery molding mixture on said mat, and if necessary, the layer on the mat is sintered at 80° – 150° C., or by applying a sheet impregnated with the molding mixture on said mat, and the thus treated mat having a surface layer thereon is compressed into a matrix molding board.

A very effective method for preventing the warp of the molded matrix is to provide a balance layer by making a layer of molding mixture on the back side of the mat or base or by applying a sheet impregnated with a thermosettable resin on the back side.

A matrix having excellent properties can be obtained by using a metal plate, net wiring or both in the molding. The metal plate used here has perforated holes or both perforated holes and grooves.

3,699,204

METHOD FOR MAKING FIN-FREE MUTLI-BORED RUBBER SHEETS

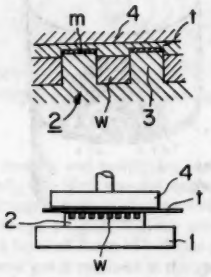
Nobuo Ogata, Kamakura, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 18, 1971, Ser. No. 144,443

Claims priority, application Japan, May 21, 1970, 45/42909

Int. Cl. B29c *17/12*

U.S. Cl. 264—154 4 Claims



A method for making fin-free multi-bored rubber sheets by pressing a starting raw-rubber sheet against a die having a plurality of die projections. A carrier sheet, which can integrally adhere to those portions of the starting rubber sheet which are strongly pressed thereto by the free ends of the die projections, is overlaid on the starting raw-rubber sheet prior to the pressing. Thereby, upon completion of the pressing operation,

the carrier sheet is separated from the starting rubber sheet, for ensuring the complete elimination of the fins at the bored portions of the rubber sheet.

3,699,205

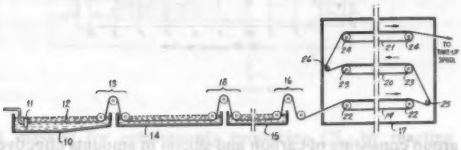
PROCESSES OF PRODUCING STABLE FILAMENTS OF LINEAR POLYURETHANES

Timothy Victor Peters, Route 2, Rockaway Road, Lebanon, N.J.

Continuation of Ser. No. 345,976, Feb. 19, 1964, abandoned. This application April 3, 1970, Ser. No. 22,142

Int. Cl. D01d 5/12

U.S. Cl. 264—210 F **4 Claims**



Mechanically stable wet spun linear polyurethane are produced by extruding a linear polyurethane polymer solution to form a filament, passing the formed filament through at least one extraction bath to remove solvent therefrom at sufficiently high rate to effect a draw ratio of at least 1.1 and heating the extracted filament to a temperature above the second order of transition temperature and below the melting point of the linear polyurethane of the filament for a period sufficient to substantially completely relax the longitudinal stresses contained in the filament.

3,699,206

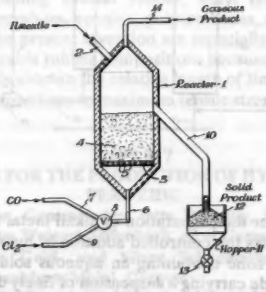
PROCESS FOR BENEFICIATION OF TITANIFEROUS ORES

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Wendell E. Dunn Inc., Sydney, Australia

Filed March 23, 1970, Ser. No. 21,686

Int. Cl. C01g 23/04, 49/10

U.S. Cl. 423—74 **12 Claims**



Process for beneficiating titaniferous ores to produce essentially pure titanium dioxide comprising alternatingly contacting the ore in a gas-solids reactor with carbon monoxide for a short period of time and then with chlorine for a short period of time and then repeating the alternate carbonylation and chlorination steps at temperatures of 700 to 1,150° C. under fluidizing conditions; converting iron oxide and oxides of metals other than titanium in the ore to iron and other metal chlorides and removing same by volatilization. The titanium dioxide produced is useful as a starting material for the preparation of titanium dioxide pigment.

3,699,207

PROCESS FOR THE PURIFICATION OF CADMIUM SOLUTIONS

Wilhelm Roever; Helmut Junghanss, both of Duisburg, and Hans-Werner Kauczor, Leverkusen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 27, 1970, Ser. No. 41,052

Claims priority, application Germany, July 11, 1969, P 19 29 661.8

Int. Cl. C22b 17/04

U.S. Cl. 423—100 **7 Claims**

Process for producing cadmium solutions wherein said solution is contacted with a cation exchanger containing amino carboxylic- or imino carboxylic acid groups and wherein the ion exchanger is separated from the cadmium solution after having absorbed accompanying metals from said cadmium solution.

3,699,208

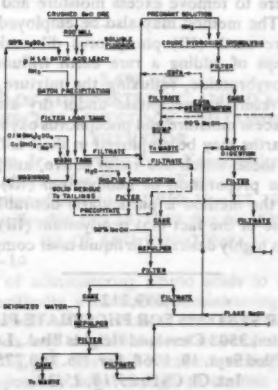
EXTRACTION OF BERYLLIUM FROM ORES

James K. Grunig; William B. Davis, both of Tucson, Ariz., and William C. Aitkenhead, Belige City, British Honduras, assignors to The Anaconda Company, New York, N.Y.

Continuation-in-part of Ser. No. 710,984, March 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 316,474, Oct. 15, 1963, Pat. No. 3,395,975. This application Dec. 21, 1970, Ser. No. 100,354

Int. Cl. C22b 59/00

U.S. Cl. 423—132 **6 Claims**



The extraction and the recovery of beryllium substantially devoid of zinc and other impurities from low and medium grade acid-leachable berllium bearing ores, e.g., bertrandite, is accomplished by acid leaching at a pH below about 2 but above about 1.2, preferably between 1.3 and 1.5, and advantageously with the aid of a soluble fluoride additive to recover the beryllium in solution with relatively small dissolution of such impurities as iron and aluminum.

3,699,209

HF REMOVAL SYSTEM

Dennis J. Ward, South Barrington, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 26, 1971, Ser. No. 119,404

Int. Cl. B01d 53/34

U.S. Cl. 423—240 **10 Claims**

In scrubbing systems wherein HF contained in gaseous steams is removed by scrubbing with an aqueous calcium

hydroxide system, corrosion is diminished by the addition of up to about 3 percent by weight of an alkali metal hydroxide.

3,699,210

METHOD OF GRAPHITIZING FIBERS

Robert C. Binning, Kettering; Leo P. Parts, Dayton; Robert J. Peresie, Brecksville, and Margaret L. Rodenburg, Kettering, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Sept. 6, 1968, Ser. No. 757,964
Int. Cl. C01b 31/07
U.S. Cl. 423—447 6 Claims

A method for carbonizing and/or graphitizing precursor fibers selected from the group consisting of polyacrylonitrile and aromatic polyamide fibers, wherein the fibers are pretreated with an oxygen-containing atmosphere at 180°–550° C. and thereafter heated in a laser beam in a non-oxidizing atmosphere at 700°–1,200° C. for carbonizing and at 1,200°–3,600 C. for graphitizing.

3,699,211

METHOD OF PREPARATION OF RARE EARTH (III) PHOSPHORUS DICHLORIDATES AND PHOSPHORUS DIBROMIDATES

Erhard J. Schimitschek, Garching/Munich, Germany, and John A. Trias, La Mesa, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 29, 1971, Ser. No. 110,920
Int. Cl. C22b 59/00
U.S. Cl. 423—263 9 Claims

A novel and desirable method of preparing a rare earth (III) phosphorus dichloridate comprises the steps of adding a rare earth trifluoroacetate to phosphorus oxychloride, refluxing the mixture and then washing the resultant percipitate under a dry atmosphere to remove excess moisture and phosphorus oxychloride. The method may also be employed in preparation of a rare earth (III) phosphorus dibromidate by the analagous steps of adding a rare earth trifluoroacetate to phosphorus oxybromide, refluxing the mixture, and finally washing the resultant precipitate under dry atmosphere to remove the excess moisture and phosphorus oxybromide. Any of the rare earths may be employed in their trifluoroacetate form except those which are radio active, and, though not limited to the preparation of neodymium (III) phosphorus dichloridate, the method is particularly desirable in that instance because of the fact that neodymium (III) phosphorus dichloridate is highly desirable in liquid laser compositions.

3,699,212

WATER SYSTEMS FOR PHOSPHATE PLANTS

Gordon F. Palm, 3503 Cleveland Heights Blvd., Lakeland, Fla.

Filed Sept. 19, 1968, Ser. No. 760,775
Int. Cl. C01b 25/18, 25/28
U.S. Cl. 423—307 12 Claims

Systems for use and handling of water in phosphate plants to reduce air and stream pollution, to reduce losses, and to reduce costs. The pH^+ of water from scrubbers, condensers, filters, and the like, is adjusted by addition of ammonia for reuse in the plant. Multiple pH^+ adjusted water systems may be employed.

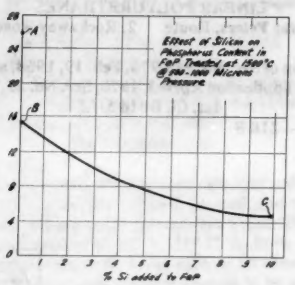
3,699,213

DEPHOSPHORIZATION OF FERROPHOSPHORUS

Cornelius M. Cosman, Bronxville, N.Y., and Donald O. Buker, Grand Junction, Colo., assignors to American Metal Climax, Inc., New York, N.Y.

Filed Dec. 24, 1969, Ser. No. 888,000
Int. Cl. C01b 25/02; C22c 33/00
U.S. Cl. 423—322 2 Claims

A method is provided for the dephosphorization of ferrophosphorus containing about 20 to 30 percent phosphorus, with or without vanadium, chromium, nickel, manganese, etc., and the bulk of the ferrophosphorus alloy comprising essentially iron, wherein a bath of said ferrophosphorus is established containing at least one additive selected from the group consisting of carbon and silicon in amounts effective to reduce the solubility of phosphorus in said bath, thereby resulting in a substantial amount of phosphorus vapor which is removed and then recovered.

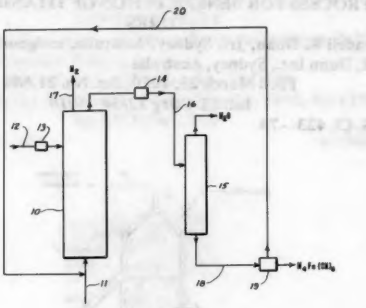


3,699,214

PROCESS FOR THE MANUFACTURE OF FERROCYANIDE COMPOUNDS

Jon C. Thunberg, Amherst, and James E. Philbrook, Nashua, both of N.H., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 1, 1970, Ser. No. 33,646
Int. Cl. C01c 3/12; C01b 1/07
U.S. Cl. 423—367 5 Claims



A process for the preparation of alkali metal ferrocyanides which comprises the controlled addition of hydrogen cyanide to a reaction zone containing an aqueous solution of alkali metal hydroxide carrying a suspension of finely divided metallic iron, allowing the reaction to proceed at elevated temperatures, separating the caustic solution from the iron, recovering alkali metal ferrocyanide therefrom, and returning mother liquor to the reactant zone for further reaction with hydrogen cyanide, alkali metal hydroxide, and iron, and, in a preferred version, conducting the process with a plurality of solutions which are returned to the reaction zone in sequence after recovery of the alkali ferrocyanide therefrom.

3,699,215
PRODUCTION OF CARBON DISULPHIDE FROM HYDROCARBONS

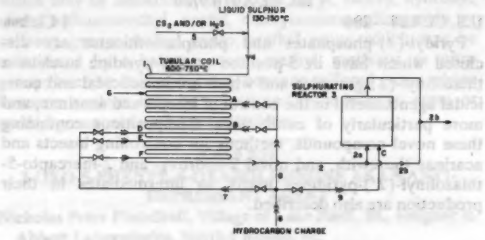
Paul Gerin, Clair du Rhone; Lucien Louat, Lyon, and Jean-Pierre Quillet, les Roches de Condrieu, all of France, assignors to Progil, Paris, France

Filed March 19, 1969, Ser. No. 808,598

Claims priority, application France, March 26, 1968, 68145513

Int. Cl. C01b *31/26*

U.S. Cl. 423—443 **9 Claims**



A method for continuously producing CS_2 by reacting sulphur in the gas phase with an unsaturated aliphatic hydrocarbon, such a propylene, in sulphurating apparatus in which the sulphur circulates the hydrocarbon being injected into the apparatus at at least two points and then condensing and recovering the CS_2 therefrom. The sulphurating apparatus may include a reactor in addition to a coil within a furnace, and one of the points of injection can be to the reactor.

3,699,216
FINELY DIVIDED CARBON AND THE PREPARATION THEREOF

William W. Gotshall, Orchard Lake, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 666,011, Sept. 7, 1967, abandoned. This application Aug. 10, 1970, Ser. No. 62,688

Int. Cl. C01b *31/02*; C09c *1/44*

U.S. Cl. 423—449 **10 Claims**

The present invention comprises a finely divided carbon suitable for compounding with polymeric materials to form intermediate strength, intermediate modulus compositions, said form of carbon being prepared by a process comprising the steps of comminuting coke and contacting it with methanol, either during or after comminution and related processes.

The compositions of the present invention are useful as fillers and reinforcing agents for a wide variety of polymeric materials including natural rubber, butyl rubber, nylons, methylmethacryalates, epoxies, polyurethanes, etc. The compositions of the present invention are especially preferred for use in vulcanizable rubber compositions because of their ability to materially shorten the relative length of time required to cure such compositions to maximum tensile strength.

3,699,217
PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE

Gerd Schreyer, Grossauheim; Otto Weiberg, Neu-Isenburg, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silver Schneideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed March 23, 1970, Ser. No. 22,000

Claims priority, application Germany, March 22, 1969, P 19 14 739.8

Int. Cl. C01b *15/02*; C07c *49/68*

U.S. Cl. 423—589 **10 Claims**

Esters of trialkyl acetic acids; preferably pivalic acid, with higher alkanols, glycols, phenols or cycloalkanols are employed as solvents for the reaction carriers in the anthraquinone process for preparing hydrogen peroxide.

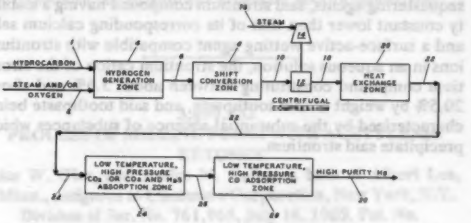
3,699,218
HYDROGEN MANUFACTURE

Calvin S. Smith, and William J. McLeod, both of El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 754,031, Aug. 20, 1968, abandoned which is a continuation-in-part of Ser. No. 736,520. May 17, 1968, Pat. No. 3,618,331, and a continuation-in-part of Ser. No. 665,106, Sept. 1, 1967. abandoned. This application June 12, 1970, Ser. No. 46,564

Int. Cl. C01b *1/02*, *1/26*, *1/32*

U.S. Cl. 423—648 **5 Claims**



Process for obtaining high purity, high pressure hydrogen wherein hydrogen-rich gas containing carbon dioxide and carbon monoxide is centrifugally compressed to high pressure, the carbon dioxide is then removed from the high pressure hydrogen-rich gas by absorption at low temperature to obtain a high pressure, low temperature hydrogen-rich gas containing carbon monoxide and then the carbon monoxide is removed from the hydrogen-rich gas by adsorption at low temperature and high pressure.

3,699,219
METHOD OF ADMINISTERING AMINO ACIDS TO CONVALESCING LIVESTOCK AND COMPOSITION THEREFOR

Arthur Carlson, Jr., Overland Park, Kans., assignor to Haver-Lockland Laboratories, Shawnee, Kans.

Continuation of Ser. No. 551,910, May 23, 1966. This application July 15, 1969, Ser. No. 545

Int. Cl. A61k *9/00*, *27/00*

U.S. Cl. 424—14 **8 Claims**

A method of administering amino acids to convalescing livestock. Specifically, a method of administering amino acids to livestock unable to eat a normal diet is provided whereby the amino acids may be administered as a bolus using a conventional balling gun. The amino acid-containing bolus is of a size and composition large enough to contain a significant amount of an animal's minimum daily requirement of amino acids and to disintegrate in the stomach of the animal at approximately the rate of usage thereof by the animal yet small enough to permit introduction into the throat without gagging the animal.

3,699,220
DENTIFRICE

Jan Weststrate, and Christiaan Albertus Johannes Grabe, both of Amersfoort, Netherlands, assignors to N.V. Cosmetische Fabriek "Prondenta", Amersfoort, Netherlands

Filed July 10, 1970, Ser. No. 53,990

Int. Cl. A61r *7/16*

U.S. Cl. 424—52 **3 Claims**

A dentifrice having anticariogenic activity is prepared by including therein a monofluophosphateand a trimetaphosphate.

3,699,221

DENTAL PREPARATIONS

Murray L. Schole, 487 Munroe Avenue, North Tarrytown, N.Y., and Richard S. Gubner, Middle Neck Road, Sands Point, Port Washington, N.Y.

Continuation-in-part of Ser. No. 778,329, Dec. 5, 1958, abandoned. This application Feb. 23, 1965, Ser. No. 434,678

Int. Cl. A61r 7/16

U.S. Cl. 424—54 14 Claims

A water-containing toothpaste comprising a substantially stable solution of a non-toxic, water-soluble ionic strontium compound selected from the class consisting of strontium salts of organic chelating agents and strontium salts of inorganic sequestering agents, said strontium compound having a stability constant lower than that of its corresponding calcium salt, and a surface-active wetting agent compatible with strontium ions in an aqueous solution, the strontium cation of the strontium compound constituting between about 3.6% and about 20.5% by weight of said toothpaste, and said toothpaste being characterized by the substantial absence of substances which precipitate said strontium.

3,699,222

PRODUCTION OF VIRAL INTERFERING SUBSTANCES

Alick Isaacs, London, England, and Jean Lindenmann, Gainesville, Fla., assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 575,470, Aug. 26, 1966, abandoned, which is a continuation of Ser. No. 183,413, March 29, 1962, abandoned, which is a continuation-in-part of Ser. No. 734,106, May 9, 1958, abandoned. This application Aug. 5, 1968, Ser. No. 757,188

Claims priority, application Germany, March 11, 1958, P 10 62 391.3

Int. Cl. A61r 27/00

U.S. Cl. 424—85 4 Claims

1. Interferon.

3,699,223

ENHYGROFUNGIN AND PROCESS FOR PREPARING THE SAME

Malcolm E. Bergy; Herman Hoeksema, and LeRoy E. Johnson, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 13, 1969, Ser. No. 833,135

Int. Cl. A61k 21/00

U.S. Cl. 424—121 7 Claims

Antibiotic enhygrofungin producible by culturing *Streptomyces hygroscopicus* var. *enhygrus* var. nova in an aqueous nutrient medium. Enhygrofungin inhibits the growth of various fungi. For example, it is active against *Cryptococcus neoformans* and can be used to treat pigeon roosts to inhibit this fungus which has been found in pigeon droppings.

3,699,224

METHOD FOR PROMOTION OF GROWTH OF CULTURED FISH

Masaaki Yamasaki, 3, Mukomotomachi 3-chome, Amagasaki, Hyogo; Kuniyoshi Fujie, 32-349, Nampeidai, Takatsuki, Osaka, and Haruo Fukui, 520, Yamada-shimo, Suita, Osaka, all of Japan

Filed May 20, 1969, Ser. No. 826,288

Claims priority, application Japan, May 24, 1968, 43/34776

Int. Cl. A61k 21/00

U.S. Cl. 424—181 4 Claims

Rate of growth of cultured fish is increased by the use of fish food containing macrolide antibiotics.

3,699,225

CONTROL OF INSECTS AND ACARINAL WITH CERTAIN PYRIDYL-THIAZALINO PHOSPHATES AND THE CORRESPONDING PHOSPHOROTHIOATES

Kurt Gubler; Urs Meyer, both of Riehen, and Hans Ulrich Brechbuhler, Basel, all of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 762,643, Sept. 25, 1968, Pat. No. 3,535,325. This application June 23, 1970, Ser. No. 53,356

Claims priority, application Switzerland, Sept. 29, 1967, 13636/67

Int. Cl. A01n 9/36

U.S. Cl. 424—200 4 Claims

Pyridyl-(2)-phosphates and phosphorothioates are disclosed which have in 5-position at the pyridine nucleus a thiazolinyl-(2) grouping and which are insecticidal and acaricidal agents useful in the control of insects and acarinae, and more particularly of cattle ticks. Compositions containing these novel compounds, methods for controlling insects and acarinae therewith, and novel 2-hydroxy- and 2-mercapto-5-thiazolinyl-(2')-pyridines useful as intermediates in their production are also described.

3,699,226

N-ARYLSULFONYL UREA DERIVATIVES OF NITROGEN CONTAINING HETEROCYCLICS AS HYPOGLYCEMIC AGENTS

Henri Dietrich, Ariesheim, Baselland, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 735,974, June 11, 1968, Pat. No. 3,542,768, which is a continuation-in-part of Ser. No. 512,776, Dec. 9, 1965, abandoned, and a continuation-in-part of Ser. No. 596,770, Nov. 25, 1966, abandoned. This application March 2, 1970, Ser. No. 18,802

Int. Cl. A61k 27/00

U.S. Cl. 424—244 7 Claims

N-Arylsulfonyl urea derivatives of 5 to 8 membered saturated lactams are hypoglycemic agents.

3,699,227

PHARMACEUTICAL COMPOSITIONS OF PHENYL PYRIDYL ALKANOIC ACID AND DERIVATIVES THEREOF

Peter Doyle, and Joseph Gilbert Stacey, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 682,593, Nov. 13, 1967, Pat. No. 3,546,237. This application Aug. 5, 1970, Ser. No. 61,406

Int. Cl. A61k 27/00

U.S. Cl. 424—263 8 Claims

This disclosure relates to phenyl-pyridyl-alkanoic acids and derivatives which possess anti-inflammatory, analgesic and antipyretic activity, and which reduce the concentration of fibrinogen, cholesterol and triglycerides in blood. It also relates to processes for making said compounds, to pharmaceutical compositions, and to methods of treatment involving said compounds. A representative of said compounds is 6-(4-chlorophenyl)-2-methylpyrid-3-ylacetic acid.

3,699,228

CARBAMOYL SACCHARIN DERIVATIVES AS FUNGICIDES

Osamu Shioyama, Osaka; Seizo Mine, Ibaragi-shi, and Kikuzo Murata, Kawachinagano-shi, all of Japan, assignors to Nihon Nahyaku Co., Ltd., Tokyo, Japan

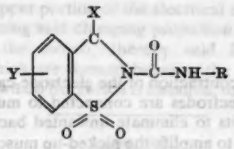
Filed Oct. 21, 1969, Ser. No. 868,236

Claims priority, application Japan, Oct. 25, 1968, 43/77381; Sept. 9, 1969, 44/71023

Int. Cl. A01n 9/12, 9/22

U.S. Cl. 424—270 5 Claims

Carbamoyl saccharin derivatives of the formula:



wherein X signifies an oxygen atom or sulfur atom, Y signifies a hydrogen atom, halogen atom or methoxy group, and R signifies an aliphatic hydrocarbon group; aryl group; aryl group which may be substituted by a lower alkyl, alkoxy, hydroxyl, nitro, trifluoromethyl, acetyl, dialkylamino, sulfonamido or carboxy group; aralkyl group; aralkyl group which may be substituted by a halogen atom, methyl, methoxy, or nitro group; benzene sulfonyl group, benzene sulfonyl group whose benzene nucleus may be substituted by a halogen atom or methyl group, are useful as fungicides.

3,699,229

2-OXO-5-PHENYL-4-OXAZOLIDINONE AS AN ANTI-DEPRESSANT AGENT

Nicholas Peter Plotnikoff, Village of Lake Bluff, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 18, 1970, Ser. No. 99,725
Int. Cl. A61k *27/00*
U.S. Cl. 424—272 **4 Claims**

Covers a method of treating patients exhibiting symptoms of depression by administering to said patients a compound comprising 2-oxo-5-phenyl-4-oxazolidinone.

3,699,230

DIMETHYLISOSORBIDE SOLVENT FOR MUSCLE RELAXANT DRUGS

Robert Owens Beauchamp, Jr.; John Wesley Ward, and Bernard Vincent Franko, all of Richmond, Va., assignors to A. H. Robins Company Incorporated, Richmond, Va.

Filed March 12, 1971, Ser. No. 123,847
Int. Cl. A61k *27/10*
U.S. Cl. 424—272 **11 Claims**

Novel compositions comprising dimethylisosorbide solutions of otherwise difficultly soluble muscle relaxant drugs and their applications are described. Additive synergism of muscle relaxant properties of the solvent and solute is disclosed.

3,699,231

METHOD FOR INHIBITING THE GROWTH OF BACTERIA USING A SYNERGISTIC MIXTURE OF SODIUM DIMETHYLDITHIOCARBAMATE AND FORMALDEHYDE

Eugene R. Werlein; John W. Hollingsworth, and Lyndon D. Pinson, all of Harris County, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed July 11, 1969, Ser. No. 841,129
Int. Cl. A01n *9/02, 9/12, 9/24*
U.S. Cl. 424—286 **1 Claim**

A method for inhibiting microbial growth in substances and a biocidal composition therefor employing a synergistic mixture of sodium dimethyldithiocarbamate and formaldehyde.

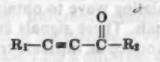
3,699,232

PROCESS OF MILLING FUNGI WITH ACETYLENIC KETONES

Delta W. Gier, and Audra M. Calhoon, both of Albert Lea, Minn., assignors to Chemagro Corporation, New York, N.Y.

Division of Ser. No. 761,965, July 16, 1968, Pat. No. 3,592,922, which is a division of Ser. No. 675,318, Oct. 16, 1967, abandoned. This application May 26, 1970, Ser. No. 40,712
Int. Cl. A01n *9/24*
U.S. Cl. 424—331 **8 Claims**

Compounds of the formula

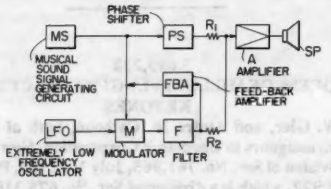


where R_1 is ethyl or phenyl and R_2 is lower alkyl are useful as fungicides. The compound 3-heptyn-5-one is particularly valuable since it is not toxic to plants.

3,699,233
TREMOLO ARRANGEMENT FOR AN ELECTRONIC MUSICAL INSTRUMENT EMPLOYING FEEDBACK OF MODULATED SIGNAL TO MODULATOR INPUT

Syoichi Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Jan. 6, 1971, Ser. No. 104,229
Claims priority, application Japan, Jan. 12, 1970, 45/3343; Jan. 23, 1970, 45/6523
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.22 4 Claims

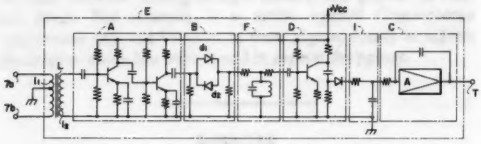


A carrier wave having a sub-audible frequency is modulated in amplitude by a modulating wave of a tone signal having an audible frequency, thereby producing a resultant modulated output signal including side band components deviated from the original tone signal frequency by a deviation amount equal to the carrier frequency. The frequency of the carrier wave is selected to be much lower than that of the modulating wave. The frequency-deviated signal thus obtained is fed back and admixed with the modulating wave to obtain a multiplicity of frequency-deviated signals. These signals are mixed with the original tone signal to produce an intricate tremolo effect.

3,699,234
MUSCULAR VOLT AGE-CONTROLLED TONE MODIFYING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed April 29, 1971, Ser. No. 138,619
Claims priority, application Japan, May 6, 1970, 45/38514; May 6, 1970, 45/38515; May 28, 1970, 45/45890; May 28, 1970, 45/45891; May 28, 1970, 45/45892; June 6, 1970, 45/49019; June 10, 1970, 45/50111; June 13, 1970, 45/51238; June 24, 1970, 45/54970; July 7, 1970, 45/59316; July 16, 1970, 45/62453
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 18 Claims

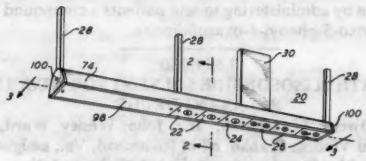


Tone modifying circuits of an electronic musical instrument such as keyers, vibrato circuit, tone coloring circuit, tremolo effect producing circuit, volume circuit and like circuits can be controlled as desired by the player in accordance with the variation of the muscular voltages produced across selected muscles of the player provided with pickup means. To this end, at least one pair of muscular voltage pickup electrodes are attached onto at least one selected portion of the player's skin under which a very low level muscular voltage is generated upon contraction of the electrode-carrying muscle. These pickup electrodes are connected to muscular voltage processing circuits to eliminate unwanted background noise components and to amplify the picked-up muscular voltage to a desired level. The processed voltage is then supplied to control terminals of the modifying circuits in the form of either pulses or DC potentials. In case a plurality of pickup electrodes are mounted on fingers of the player, various touch-responsive tone controls are possible. By summing various levels of muscular voltages obtained from a number of paired pickup electrodes arranged in different portions of the player's skin, random control of the modifying circuits can be achieved to provide tonal effects rich in variety.

3,699,235
HOSPITAL OVERHEAD SERVICE MODULE

John H. Wasson, Portage; John S. Sherry, McFarland, and John P. Kayser, Madison, all of Wis., assignors to Airco, Inc., New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 177,060
Int. Cl. H02g *3/08*
U.S. Cl. 174—48 7 Claims

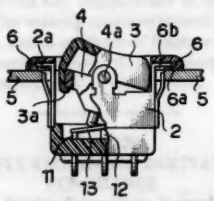


An overhead service module for use in hospital facilities to supply medical gases, vacuum and electrical services within the convenient reach of attending personnel. The module is constructed of easily assembled components and, when installed, is an elongated unit having an inverted tear drop design cross section to allow a laminar flow of air to pass downwardly past the module without seriously interrupting the smooth continuous flow.

3,699,236
SWITCH FLOURISH PLATE

Yasuo Kodaira, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed April 16, 1971, Ser. No. 134,768
Claims priority, application Japan, May 20, 1970, 45/49159
Int. Cl. H02g *3/14*
U.S. Cl. 174—66 2 Claims



The switch flourish plate includes slots provided opposite to each other in two faces of the walls of an aperture in said flourish plate and clamping projection provided adjacent to either of said two slots. This structure permits said flourish plate to be secured to an electrical switch, without using screws, rivets or the like, by means of fitting two flanges pro-

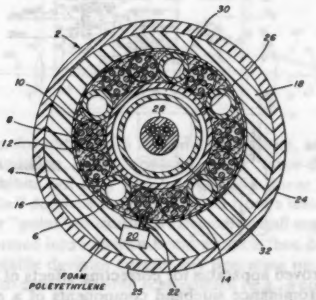
vided on the upper portion of the electrical switch to said two slots and inclining said clamping projection in the inner side direction of the switch, thereby said flanges and the clearances, which are formed between the electrical switch and a panel to which the switch is installed, to be covered.

3,699,237

BUOYANT ELECTRIC CABLE

Thomas J. Mella, Sutton, Mass., assignor to United States Steel Corporation

Filed Feb. 10, 1971, Ser. No. 114,274
Int. Cl. H01b 7/12
U.S. Cl. 174—101.5 12 Claims



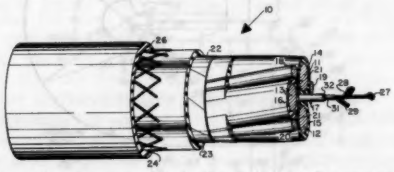
A buoyant electric cable has a core member such as a pipe for supporting a plurality of elements which are stranded around the core member. Some of said elements are electric conductors and the other elements are tubes which are adapted to receive a fluid for changing the buoyancy of the cable. An eccentric foamed jacket surrounds the stranded elements with a sensing element embedded in the thickest part of the jacket. A protective jacket is preferably provided over the outside of the foamed jacket.

3,699,238

FLEXIBLE POWER CABLE

Theodore E. Hansen, and Floyd A. Wilson, both of Marion, Ind., assignors to Anaconda Wire and Cable Company

Filed Feb. 29, 1972, Ser. No. 230,364
Int. Cl. H01b 9/00
U.S. Cl. 174—115 6 Claims



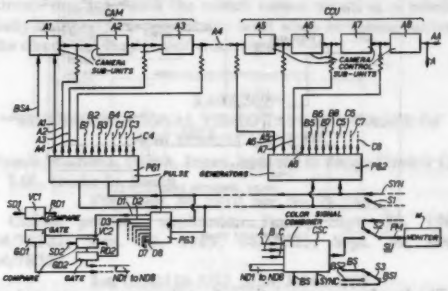
A flexible power cable for use on mining machines has a central insulated ground check strand comprising conductor wires that are wound around a stretchable tensile core.

3,699,239

TELEVISION EQUIPMENTS FOR FAULT INDICATION

Anthony Norman Heightman, Chelmsford, England, assignor to The Marconi Company Limited, London, England

Filed July 15, 1970, Ser. No. 55,145
Claims priority, application Great Britain, Aug. 7, 1969, 39,588/69
Int. Cl. H04n 9/08
U.S. Cl. 178—5.4 TE 18 Claims



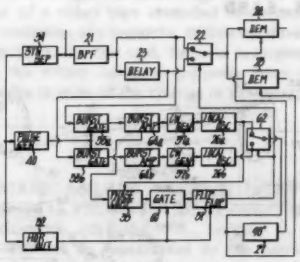
A television equipment consisting of a number of sub units includes fault indicating and locating apparatus. The fault indicating and locating apparatus comprises a display device having raster scanning in synchronism with the television equipment scanning raster and predetermined signals are applied to different equipment sub-units for different fractions of the television raster line, and field, periods. Signals that have been passed through different combinations of sub-units are applied to sub areas of the display device, each sub area of the display device representing a different sub-unit.

3,699,240

COLOR TELEVISION RECEIVER

Minoru Morio, and Hiroyuki Kimura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 19, 1970, Ser. No. 90,904
Claims priority, application Japan, Aug. 8, 1970, 45/69489; Aug. 8, 1970, 45/69490; Aug. 20, 1970, 45/72936
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 P 22 Claims



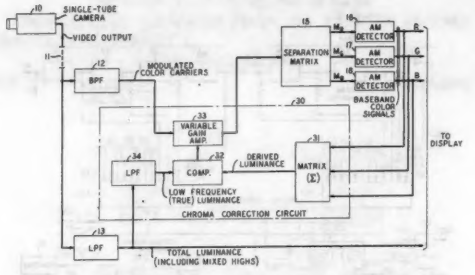
A color television receiver utilizing the chrominance information in only alternate lines of the video signal. The signal from these alternate lines is also delayed for one scanning period, normally one line period. A switching system is provided for interlacing the delayed signals with the undelayed signals to produce a composite signal equal in duration to the signal transmitted. Since the video information on adjacent lines or scans is virtually identical, this elimination and substitution is not noticed by the viewers' eye.

3,699,241

COLOR TELEVISION SYSTEM WITH AUTOMATIC CORRECTION OF CHROMA AMPLITUDES

Arthur Bertel Larsen, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J

Filed Jan. 6, 1971, Ser. No. 104,412
Int. Cl. H04n 9/04, 9/48
U.S. Cl. 178—5.4 AC 9 Claims



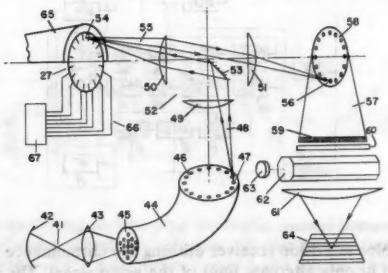
The low frequency portion of a color camera output signal is monitored and used to correct the carrier-borne color components of the composite output. The inherent redundancy of four independent video components provides the monitoring capability. A suggested embodiment utilizes a true low frequency luminance signal and the three carrier-borne color components (preferably red, green and blue). These components are detected and the resulting baseband signals are combined to yield a derived luminance signal. Comparison of the true and derived luminance produces a control signal which is fed back to vary the common factor by which all of the color components are amplified. In this manner compensation is provided for degradation of the carrier frequency (color) components, such as may be caused by loss of resolution of the camera tube or high frequency roll-off of a transmission link.

3,699,242

ELECTRO-OPTICAL DISPLAY SYSTEM

Edgar E. Price, 648 Applegrove Circle, Webster, N.Y.

Continuation-in-part of Ser. No. 789,317, Jan. 6, 1969, Pat. No. 3,567,847. This application Feb. 24, 1971, Ser. No. 118,461
Int. Cl. H04n 9/12, 5/66
U.S. Cl. 178—5.4 BD 18 Claims



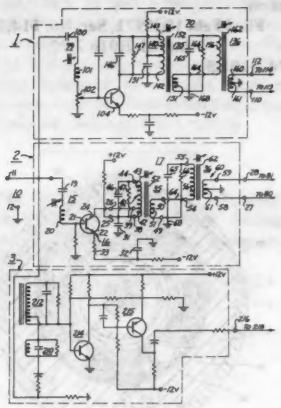
An electro-optical display system particularly for projecting an enlarged color television image on a screen in which the transmitted signals are converted into points of light modulated by a multiple Fabry-Perot interferometric or multiple electro-optical light modulator assembly.

3,699,243

SIGNAL CORRECTING APPARATUS FOR CANCELLING DIFFERENTIAL PHASE ERRORS IN COLOR VIDEO TAPE RECORDINGS

Bert H. Dann, Mountain View, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed April 13, 1971, Ser. No. 133,646
Int. Cl. H04n 5/78
U.S. Cl. 178—5.4 CD 16 Claims



An improved apparatus for correcting effects of angular errors in chrominance sideband components of a color video signal in which the chrominance sideband components, and signals indicative of the angular errors, as well as a substantially stable reference signal, are heterodyned to redispose the chrominance sideband components about a frequency which is displaced from a picture carrier frequency by a stable frequency difference.

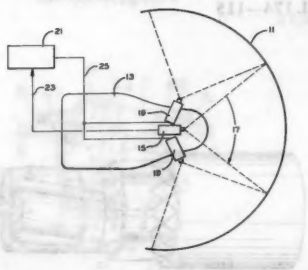
The disclosure also covers an improved band filter useful in the above mentioned and other apparatus.

3,699,244

APPARATUS TO MATCH THE COLOR OF A MONOCHROME DISPLAY TO AVERAGE COLOR OF AN ADJACENT FULL COLOR DISPLAY

Edwin Cohen, Binghamton, and John C. Altmiller, Kirkwood, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Aug. 23, 1971, Ser. No. 173,843
Int. Cl. H04n 9/12, 5/58
U.S. Cl. 178—5.4 R 17 Claims



Apparatus, for use in a display system wherein a central high resolution color image is supplemented by crude monochrome display, which senses the average color in the high resolution display and adds that color to the monochrome display is shown. Two embodiments for use with projected images are described. One in which the sensed color is provided by passing the light through a C.I.E. diagram posi-

tioned by the sensed color signals to obtain a matching color and a second in which controlled amounts of light are mixed to obtain the color. An embodiment for use with a CRT displays in which the three color video signals are averaged of a line on the high resolution display and the average provided to the monochrome displays is also shown.

3,699,245

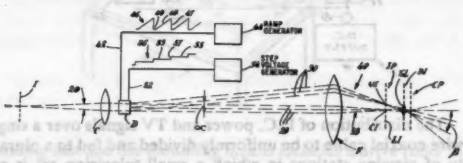
PICTORIAL SYSTEMS, HAVING HIGH RESOLUTION IMAGERY AT ALL OBJECT DISTANCES

Roderic M. Scott, Stamford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed March 11, 1970, Ser. No. 18,624

Int. Cl. H04n *3/10*

U.S. Cl. 178—6 **7 Claims**



A system for obtaining a reproducable image, as for television transmission, of a reduced scale three-dimensional model, exhibits not only high angular and linear resolution, but "infinite" depth of focus. Radiation from a laser, focussed to a spot or "point" source with extremely small angular divergency is formed into a narrow beam which is then deflected by rapidly variable deviator (preferably operating on collimated radiation) to cause a desired scan pattern (e.g., a conventional line by line type of rastor). Additional optical elements cause effective magnification of the original deflection angle without destroying the generally narrow divergency of the scanning beam, as well as causing the effective center of the scanning sweep angle to be located at a point that may be moved extremely close to the model. A photosensitive detector "sees" the entire model to receive the radiation reflected from that part of the model being illuminated by the scanning beam at any given moment. By causing the final scanning beam image to be substantially at the closest point of approach of the scanning system to the model, the linear resolution at critically close distances is "maximized", while the relatively narrow final divergency angle assures high angular resolution at all operating distances. The signal generated by the detector can be processed and transmitted in a manner analogous to conventional television signals.

3,699,246

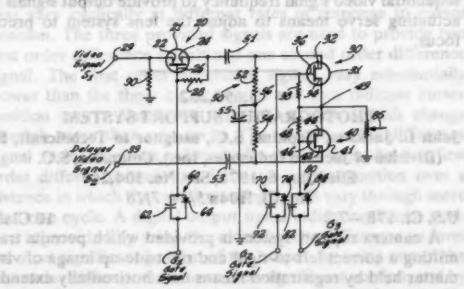
DROPOUT COMPENSATOR HAVING A SELF-BALANCING SWITCH

Frederick J. Hodge, Camarillo, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1970, Ser. No. 11,425

Int. Cl. H04n *5/21*, *5/78*

U.S. Cl. 178—6.6 DO **16 Claims**



The present invention is directed to an improved dropout compensator having a self-balancing video switch that provides an output signal having substantially a constant average voltage level. The self-balancing video switch is coupled to receive a direct video signal provided by a demodulator and normally conducts the direct video signal as the dropout compensator output signal. When a dropout is detected by a dropout detector, the dropout detector applies gate signals to the self-balancing video switch. When the self-balancing video switch receives the gate signals, the switch terminates conducting the direct video signal and initiates conducting a delayed video signal as the dropout compensator output signal. The self-balancing video switch includes a balancing circuit that maintains the switch output signal at a substantially constant average voltage level when switching between the direct and the delayed video signal.

3,699,247

MULTIFUNCTIONAL VIDEO TAPE RECORDER OF HELICAL SCAN TYPE

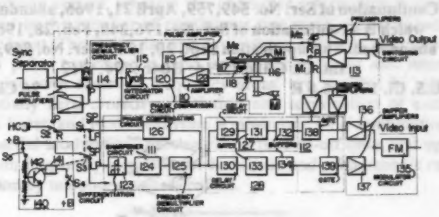
Fumio Mashima, Osaka, Japan, assignor to Sango Electric Co., Ltd., Osaka-fu, Japan

Filed Sept. 30, 1970, Ser. No. 76,744

Claims priority, application Japan, Sept. 30, 1969, 44/78322; Sept. 30, 1969, 44/78323; Sept. 30, 1969, 44/78324

Int. Cl. G11b *5/52*, *5/56*; H04n *5/78*

U.S. Cl. 178—6.6 FS **14 Claims**



There is provided a multifunctional video tape recorder of the helical scan type capable of performing normal recording and playback, slow-motion playback with the use of a video tape recorded in normal recording, long term recording and playback, accelerated motion playback with the use of a video tape recorded in long term recording, and still reproduction with the use of a video tape recorded in normal recording, without necessitating any separate, additional devices for each of these functions. To this end, there is incorporated means for causing the rotary heads to properly trace the specific recorded tracks in spite of the change in the tape transporting speed.

3,699,248

AUTOMATIC AREA OF INTEREST TELEVISION OPTICAL PROBE FOCUS APPARATUS

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy

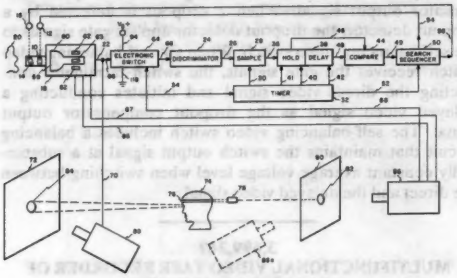
Continuation of Ser. No. 184,132, Sept. 27, 1971. This application Jan. 10, 1972, Ser. No. 216,676

Int. Cl. H04n *5/34*

U.S. Cl. 178—6.8 **7 Claims**

An automatic focusing apparatus for a television optical probe system wherein an automatic focus system normally responsive to output signals of a video camera to focus its lens system on a scene is held in inhibited condition by a normally closed electronic switch interrupting the passage of video electrical signals from said camera to said automatic focus system, and wherein a monitor screen is positioned for obser-

vation by a viewer and a sensor system responsive to head movement of the viewer is provided to produce electrical signals to gate the electronic switch to "on" condition to



thereby provide lens focusing of said camera only during that portion of the video scan corresponding to a limited area of the monitor on which the trainee viewer's eyes are focused.

3,699,249

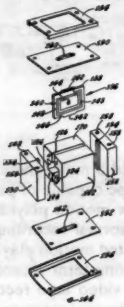
FACSIMILE SYSTEMS, TRANSCEIVERS, AND MARKING TRANSDUCERS THEREFOR

Paul J. Crane, Torrance, and Glenn A. Reese, San Pedro, both of Calif., assignors to The Magnovox Company, Torrance, Calif.

Continuation of Ser. No. 549,759, April 21, 1966, abandoned, which is a continuation of Ser. No. 176,248, Feb. 28, 1962, abandoned. This application Sept. 20, 1967, Ser. No. 669,315

Int. Cl. G01d *15/16*; **H04r** *9/04, 9/12*

U.S. Cl. 178—6.6 R **26 Claims**



This invention relates to a system for reproducing a facsimile image. The system includes a transceiver which is adapted to transmit facsimile information or to receive and record facsimile information. The transceiver includes rotary members which rotate past an arcuately disposed document to transmit the information on the document or to receive and record facsimile information on the document.

The record transducer in the transceiver includes a novel electromagnetic arrangement for recording the facsimile information on the document. This novel electromagnetic arrangement includes a thin winding which receives signals representing the facsimile information and varies the characteristics of a magnetic field in accordance with the characteristics of such signals to control the movements of a stylus.

The system constituting this invention transmits the facsimile information through telephone lines. Acoustical couplers are provided at the transmitter and at the receiver for insuring that the information can be transmitted through the telephone lines, even over long distances, and can be successfully reproduced at the receiver.

3,699,250

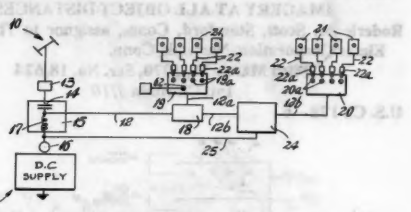
PROCESS AND SIGNAL DISTRIBUTING SYSTEM AND APPARATUS USED THEREIN

Earl L. Bunting, Westport, Conn., assignor to Bunting SteriSystems, Inc., Bridgeport, Conn.

Filed Jan. 11, 1965, Ser. No. 424,502The portion of the term of this patent subsequent to Oct. 3, 1984, has been disclaimed.

Int. Cl. H04n *5/655, 7/10*

U.S. Cl. 178—6.8 **7 Claims**



The distribution of D.C. power and TV signals over a single wire coaxial cable to be uniformly divided and fed to a plurality of viewing stations in which a small television set is adjustably supported on a spring tensioned counterbalanced arm mounted on the bed or adjacent mounting bracket to provide for individual television viewing.

3,699,251

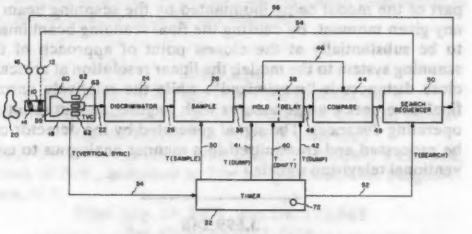
AUTOMATIC OPTICAL PROBE FOCUS APPARATUS

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 27, 1971, Ser. No. 184,132

Int. Cl. H04n *5/34*

U.S. Cl. 178—7.2 **4 Claims**



An automatic focusing device for an optical probe system based upon the phenomenon that maximum frequency of video signal above a selected gray level signal output is determinative of the precise point of the lens focus for the subject distance and in which automatic sampler and comparator means are provided to continuously sample and compare sequential video signal frequency to provide output signals for actuating servo means to adjust the lens system to precise focus.

3,699,252

PHOTOGRAPHIC SUPPORT SYSTEM

John L. Jackson, Hopkins, S.C., assignor to Technicraft, Inc. (Division of Jackson Industries, Inc.), Columbia, S.C.

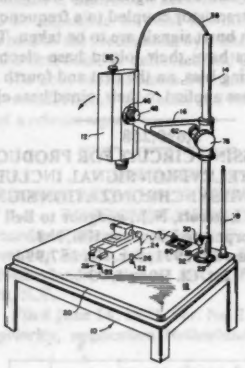
Filed Jan. 6, 1971, Ser. No. 104,267

Int. Cl. H04n *5/24, 7/18*

U.S. Cl. 178—7.2 **10 Claims**

A camera support system is provided which permits transmitting a correct left-to-right and rightside-up image of visual matter held by registration means on a horizontally extending support surface. A camera mounting bracket and a unique mounting means which connects the bracket to a vertically ex-

tending rod permit easy adjustment of the elevation of the camera with respect to the horizontal support surface. In a predetermined embodiment, the rod includes a vertically ex-



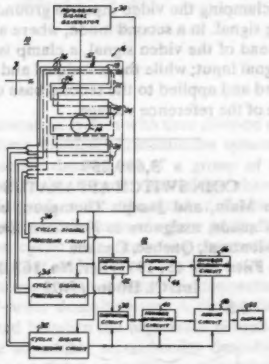
tending slot and the mounting means includes a drive roller including a projection that protrudes into the slot with the sides of the projection frictionally engaging the sides of the slot.

3,699,253

COORDINATE DETERMINING DEVICE EMPLOYING A SECOND ORDER DIFFERENCE SIGNAL TO DETERMINE APPROXIMATE CURSOR POSITION

Morris David Freedman, Southfield, Mich., assignor to The Bendix Corporation

Filed July 6, 1971, Ser. No. 159,898
Int. Cl. H04n 1/00
U.S. Cl. 178—19 **8 Claims**



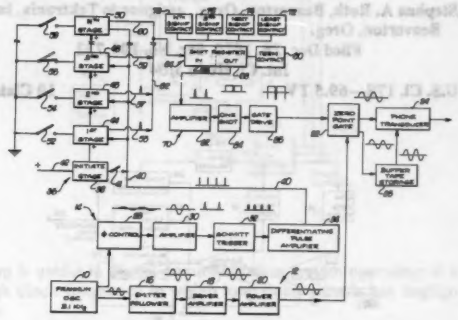
Cursor position is determined by providing three signals that vary cyclically at different rates in response to cursor position. The three provided signals are used to provide two first order difference signals and one second order difference signal. The first order difference signals vary substantially slower than the three cyclic signals and thus indicate cursor position over a distance in which the cyclic signals change through more than one cycle. The second order difference signal varies at a rate substantially slower than the two first order differences and thus indicates cursor position over a distance in which the two first order signals vary through more than one cycle. A digital output signal indicating cursor position is provided by using the second order difference to form the most significant portion of the output, by using one of the first order differences to form a less significant portion, and by using one of the three cyclic signals to provide the least significant output signal.

3,699,254

CODE TONE PULSE TRAIN DATA TRANSMITTING AND RECEIVING SYSTEM USING SINE WAVE GATING

James C. Nailen, Santa Ana, Calif., assignor to International Data Systems, Reno, Nev.

Filed Nov. 17, 1969, Ser. No. 877,208
Int. Cl. H04l 27/00
U.S. Cl. 178—66 R **4 Claims**



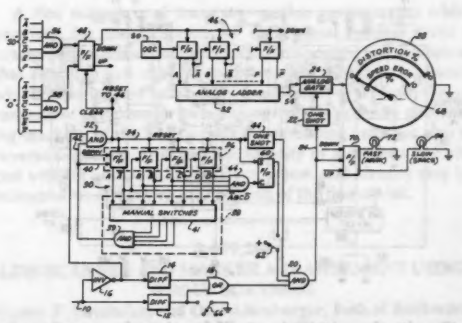
Method and apparatus for transmitting data through the medium of ordinary telephone lines and handsets. Character information is generated in the form of gated sine wave tone bursts of a fixed audio frequency compatible with the telephone system, wherein the character information is contained in the number of continuous sine wave cycles in each tone burst. The sharp rise and decay times normally associated with pulse transmission, and consequent ringing and interference with reserved frequency areas, are avoided by substantially zero crossover initiation and termination of each tone burst, and PDM distortion is minimized by a combination of partial modulation, substantial on time-to-off time, and optimum frequency selection for harmonic and subharmonic rejection by telephone system rolloff.

3,699,255

METHOD AND APPARATUS FOR MEASURING SPEED-ERROR IN A PULSE TRAIN

Jacob L. Wallace, Jr., Springfield, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.

Filed June 24, 1970, Ser. No. 49,365
Int. Cl. H04l 25/02
U.S. Cl. 178—69 M **15 Claims**



A measurement of transmission speed-error can be obtained by utilizing the present inventive concepts with conventional pulse or telegraph distortion measuring apparatus. For each character in the pulse train fed to the apparatus, a period of time is established for making measurements. The transitions which occur during this time period are measured in the normal manner and displayed. The meter or other display ap-

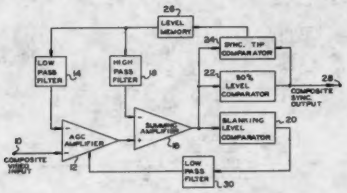
paratus is designed to divide the reading by an appropriate number in order to compensate for the cumulative effect of speed error, and an indication is also made as to whether the speed is faster or slower than normal.

3,699,256

CIRCUIT FOR ACCURATELY DETECTING THE TIME OF OCCURRENCE OF A WAVEFORM

Stephen A. Roth, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 28, 1970, Ser. No. 101,732
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5 TV **10 Claims**



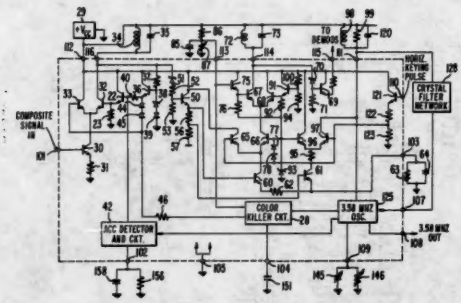
A circuit for accurately determining the time of occurrence of television synchronization pulses includes a means for establishing sync waveform tips at a first voltage value and means for controlling the amplitude of the video waveform so the blanking level achieves a second voltage value. The time of the synchronization pulse is then determined midway between these values. A pair of feedback loops are provided for substantially clamping the sync tips to the first value via a first low pass feedback circuit operating outside of the gain controlled system, and a high pass feedback circuit operating within a relatively fixed signal level environment.

3,699,257

AMPLIFIER CIRCUITS

Leopold Albert Harwood, Sommerville, and Erwin Johann Wittmann, N. Plainfield, both of N.J., assignors to RCA Corporation

Division of Ser. No. 822,887, May 8, 1969, Pat. No. 3,604,843. This application March 19, 1971, Ser. No. 126,348
Int. Cl. H04n *9/46*
U.S. Cl. 178—69.5 CB **5 Claims**



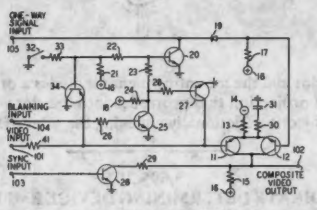
Circuitry for selectively amplifying chrominance subcarrier signal frequencies and for separating oscillatory burst therefrom in response to keying pulses includes first, second, third and fourth transistors. The first and second transistors are connected as a first switchable differential amplifier with their emitter electrodes supplied composite chrominance and burst signals and the collector electrode of the second transistor coupled to a frequency selective network from which chrominance signals are to be taken. The third and fourth transistors are connected as a second switchable differential amplifier with their emitter electrodes supplied composite chrominance and burst signals and the collector electrode of the fourth transistor coupled to a frequency selective network from which burst signals are to be taken. The second and third transistors have their joined base electrodes connected to an operating bias, an the first and fourth transistors have the keying pulses applied to their joined base electrodes.

3,699,258

VIDEO PROCESSING CIRCUIT FOR PRODUCING A COMPOSITE TELEVISION SIGNAL INCLUDING BLANKING AND SYNCHRONIZATION SIGNALS

Gabor Peter Torok, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1971, Ser. No. 157,994
Int. Cl. H04n *5/40*
U.S. Cl. 178—7.2 **7 Claims**



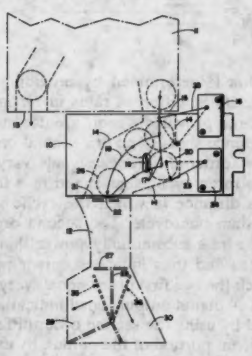
A composite video signal is produced by combining video, blanking and sync signals in an emitter coupled transistor pair that has its collectors connected together. This is achieved by applying the video signal to the first base of the transistor pair and a reference voltage to the second base of the pair. The sync is inserted at the output terminal of the circuit, the common collector junction of the transistor pair, and blanking is inserted by clamping the video input to ground in response to the blanking signal. In a second mode, where a test signal is to be used instead of the video signal, a clamp is maintained on the video signal input; while the test signal and blanking signal are combined and applied to the second base of the transistor pair in place of the reference voltage.

3,699,259

COIN SWITCH APPARATUS

Henry Allan Main, and Joseph Thompson, both of London, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed July 15, 1971, Ser. No. 163,012
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.5 **10 Claims**



Coin switch apparatus for prepay coin actuated mechanisms, such as telephones, in which a minimum prepaid

amount must be deposited before actuation of the mechanism. Where a coin deposited is equal to or more than the required minimum, the coin proceeds right through, actuating a signalling means if desired. Where two coins of a particular value must be deposited to meet the minimum amount, the first coin is held in the mechanism by a latch and a second coin will strike the first coin, be deflected and proceed through the apparatus. The coin held actuates a switch for ensuring a connection for withdrawal of the latch and release of the coin on reception of a release signal.

3,699,260

TELECOMMUNICATION SYSTEM WITH TIME DIVISION MULTIPLEX

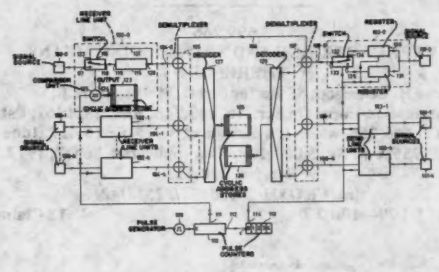
Oscar Bernardus Philomenus Rikkert De Koe, Emmasingel, Eindhoven, and Robert Jacques Marie Verbeek, Hilversum, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,524

Claims priority, application Netherlands, June 24, 1970, 7009247

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **2 Claims**



A telecommunication system with time division multiplex in which receive time multiplex transmission systems are connected to respective data stores of a group of cyclic data stores, each of which has a cycle time of one channel interval ad a plurality of store locations the number of which is at least equal to the number of channels of a time multiplex transmission system. The cyclic data stores are connected to an adjustable second-order multiplexer. The line units of the send time multiplex transmission systems are connected to an adjustable second-order demultiplexer. A connecting arrangement is connected between the adjustable second-order multiplexer and the adjustable second-order demultiplexer. Associated with the receive time multiplex transmission systems are address stores for the arbitrary association of the store locations of the cyclic data stores with the channels of the receive time multiplex transmission systems.

3,699,261

FRAME SYNCHRONIZING CIRCUIT FOR HIGH CLOCK FREQUENCY DIGITAL COMMUNICATION

Atsushi Tomozawa, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

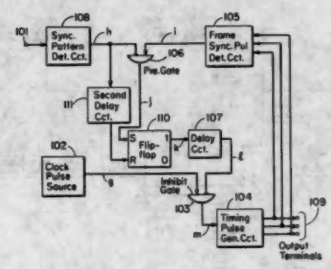
Filed Nov. 18, 1970, Ser. No. 90,705

Claims priority, application Japan, Nov. 27, 1969, 44/95505

Int. Cl. H04j *3/06*; H04l *7/08*

U.S. Cl. 179—15 BS **6 Claims**

A frame synchronizing circuit utilizes dual signal loops for inhibiting a clock pulse generator for a given time duration. The first loop includes a timing pulse generator a frame synchronous pulse detector, the set input of a bistable device an output thereof and two inhibit logic gates. The second loop control includes a synchronous pattern detector, delay means, and the reset input to the bistable device. Such dual control



loop is useful in digital communication system operating at a high clock frequency in which loop delay time is not negligible.

3,699,262

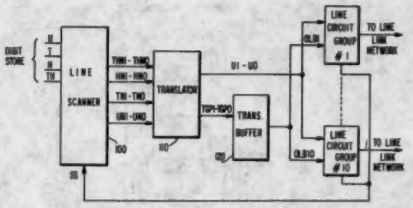
SCANNER AND TRANSLATOR-MARKER ARRANGEMENT FOR PBX

Ernest O. Lee, Jr., Fairport, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 15, 1970, Ser. No. 98,431

Int. Cl. H04q *3/47*

U.S. Cl. 179—18 ET **12 Claims**



A line scanner and translator-marker arrangement which provides for the strapping of digit signal outputs from a scanner in selective combinations to respective line circuits so that scanning and marking automatically includes translation which is performed on a continuous basis. As a result, the arrangement provides for two-way operation; not only performing marking of the line circuits for extending calls but also in reverse operation to detect the identity of a marked line circuit without additional equipment, where said identity may be independent of the physical location of the line circuit.

3,699,263

LINE SCANNER AND MARKER ARRANGEMENT USING GROUP SCANNING

Gunter F. Neumeier, and Otto Altenburger, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

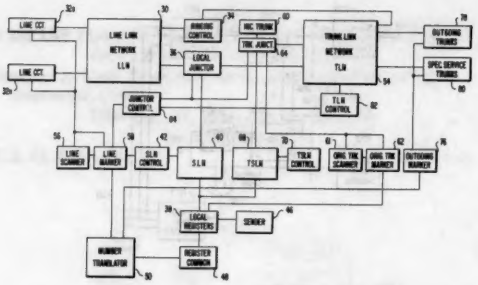
Filed Dec. 23, 1970, Ser. No. 101,091

Int. Cl. H04q *3/495*

U.S. Cl. 179—18 FF **26 Claims**

A line scanner and marker arrangement for a common control telephone system in which the line circuits are scanned in groups rather than on an individual line-by-line basis. A

request for service detected from one or more lines in a group being scanned stops the scanning on that group and initiates the scanning of the individual lines of the group. The system



may be expanded in size without changing the scanning time by scanning more than one group of lines at a time and then scanning the individual lines of the combination of groups when a request for service is detected from one or more lines.

3,699,264

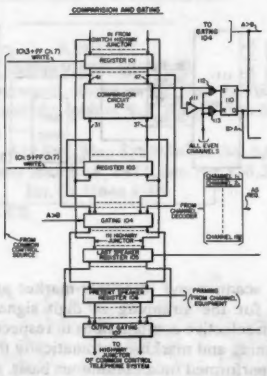
CONFERENCE CIRCUIT FOR PULSE CODE MODULATED TELEPHONY

Saytan G. Pitroda, Villa Park, and Bernard J. Rekiere, Addison, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed March 2, 1971, Ser. No. 120,152

Int. Cl. H04m *3/56*

U.S. Cl. 179—18 BC **6 Claims**



A technique for connecting a plurality of telephone channels operated on a pulse code modulated basis, in a conference arrangement. Digital signals are not converted to analog, rather binary words are compared from the participating channels, with the largest binary number selected as the speaker.

3,699,265

LINE LOCKOUT CIRCUIT

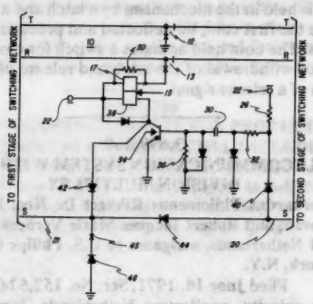
Otto Altenburger, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 108,381, Jan. 21, 1971. This application June 15, 1971, Ser. No. 153,232

Int. Cl. H04m *3/08*

U.S. Cl. 179—19 **11 Claims**

A lockout circuit for connection in a telephone switching exchange utilizes a lockout relay to isolate a telephone line from common switching equipment in the exchange whenever a telephone receiver and/or the connected telephone line form a closed loop path and no attempt is made to complete a call within a prescribed period. Removal of the ground con-



nection to the sleeve lead by the conventional timer in the trunk circuit energizes an operate winding of the lockout relay. The relay also has a hold winding connected through a set of its own contacts and the subscriber's line, and remains held up so long as the line loop remains closed.

3,699,266

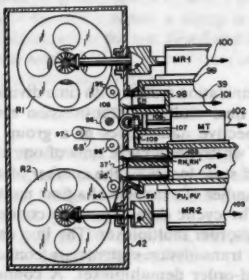
TAPE CARTRIDGE AND TRANSDUCING MEANS THEREFORE

Jerome H. Lemelson, 85 Rector Street, Metuchen, N.J.

Continuation-in-part of Ser. No. 142,748, Aug. 28, 1961, Pat. No. 3,646,258, which is a division of Ser. No. 515,417, June 14, 1955, Pat. No. 3,003,109. This application Feb. 7, 1972, Ser. No. 224,131

Int. Cl. G11b *23/08, 23/12, 23/42*

U.S. Cl. 179—100.2 Z **12 Claims**

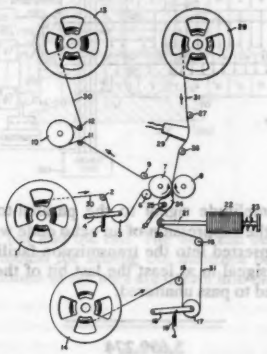


An apparatus and method for reproducing information recorded on magnetic tapes stored in a plurality of cartridges for the purpose of displaying or otherwise utilizing said information. In one form the cartridges are disposed side-by-side on a retainer which is moved with respect to a transducer to align a selected cartridge with said transducer to permit the transducing of information relative to the tape of the selected cartridge. In another form the transducer is moved past an array of cartridges and is stopped in alignment with a selected cartridge after which operative coupling is effected between the transducer and the tape of the selected cartridge. In a third form, both the array of cartridges and transducer are moved.

Means are also provided for coupling a drive means associated with the transducer to a selected tape cartridge upon alignment of the two, to effect movement of the tape in the cartridge past the transducer for scanning selected portions of the tape. The apparatus also includes remote control and automatic control elements for the means selectively positioning the cartridges and transducer and driving the tape in the selected cartridges. In yet another form, cartridges are provided which are totally enclosed to protect the tape therein

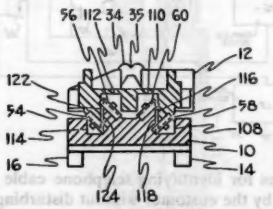
and an access door is opened to the cartridge upon aligning and coupling a selected cartridge and the transducer.

3,699,267
APPARATUS FOR COPYING MAGNETIC TAPES
Paul C. Hoell, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed March 18, 1970, Ser. No. 20,719
Int. Cl. G11b *5/86*; H01v *3/04*
U.S. Cl. 179—100.2 E **2 Claims**



A thermoremanent copying apparatus for copying signals recorded on magnetic tape in which the face of the copy tape having a layer of magnetic material is heated above the Curie temperature by contact with a metal block immediately prior to contacting a master tape in the nip of two rolls.

3,699,268
PHONOGRAPH PICKUP WITH SELF FORMED FEMALE RECEPTACLES
Michael Evans Miller, Marion, Ind., assignor to RCA Corporation
Division of Ser. No. 887,849, Dec. 24, 1969, Pat. No. 3,610,840. This application March 8, 1971, Ser. No. 121,633
Int. Cl. H04r *17/08*; G11b *3/10*
U.S. Cl. 179—100.41 K **8 Claims**



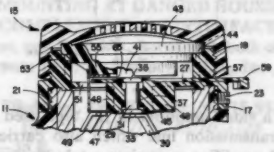
A phonograph pickup includes a case having a top section and a bottom section. A single piece elastomer member includes a stylus beam coupler, a damping block, and two interconnecting support elements mounted in the case. A transducing element is positioned on each of the support elements, with the ends of the transducing elements inserted into apertures in the beam coupler and damping block. Electrical terminals are positioned on opposing surfaces of the transducing elements. When the top and bottom case sections are secured together, female receptacles are formed. Each female receptacle includes one of the electrical terminals positioned on the transducing elements.

A guard member having a channel in its underside is secured to the housing. The guard member is positioned such that a predetermined force applied to the pickup stylus deflects the stylus carrying beam into the guard member channel.

3,699,269
DOUBLE TRANSFER TAPE COPY SYSTEM
Philip Smaller, 4155 Wilkie, Palo Alto, Calif.
Filed Sept. 30, 1971, Ser. No. 185,225
Int. Cl. G11b *5/86*
U.S. Cl. 179—100.2 E **15 Claims**

The disclosure illustrates a method and apparatus for thermomagnetically and magnetically transferring short and long wavelength signals from a master magnetic tape to a pair of magnetizable layers of an intermediate carrier. The signal on the intermediate carrier subsequently is transferred to a copy tape either magnetically or thermomagnetically.

3,699,270
TELEPHONE DISCONNECT DEVICE
Robert S. Goodrich, 27901 South Golden Meadow Drive, Palos Verdes Peninsula, Calif.
Filed Aug. 17, 1970, Ser. No. 64,308
Int. Cl. H04m *1/19*
U.S. Cl. 179—158 **13 Claims**

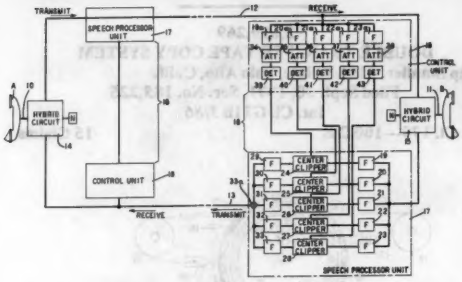


A telephone cut off device for a telephone transmitter which is an insert disposed between the mouth piece of the transmitter and the main transmitter housing. The device has contacts on one side thereof for engaging the spring contacts in the transmitter housing, the contacts extending through the device to engage the corresponding terminals on the transmitter capsule unit. A depressible means for moving one of the contacts in the device is provided to break the contact between a corresponding spring contact in the transmitter between a corresponding spring contact in the transmitter housing and corresponding terminal in the capsule unit.

3,699,271
SPEECH PROCESSOR USING MULTIBAND CONTROLLED CENTER CLIPPING
David Arthur Berkley, Red Bank; Olga Mary Mracek Mitchell, Summit, and John Robinson Pierce, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 16, 1970, Ser. No. 89,633
Int. Cl. H04b *3/24*
U.S. Cl. 179—170.8 **6 Claims**

An echo suppressor for full duplex telephone circuits consists of a filter bank of contiguous band filters in the transmission path, with each filter output feeding a separate center

clipper. Each clipping level is controlled by echo signal amplitude as attenuated by the trans-hybrid loss that occurs in the corresponding subband. The scheme permits "double-talking" while suppressing the echo component.

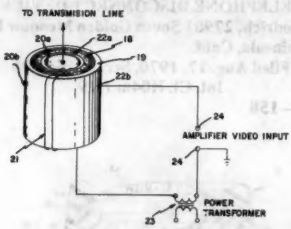


3,699,272

FILTER FOR A VIDEO AMPLIFIER

William Baird Fritz, Hershey, assignor to William Jeffrey Hudson, Jr., Hummelstown, both of, Pa. and AMP Incorporated, Harrisburg, Pa.

Filed May 12, 1971, Ser. No. 142,710
Int. Cl. H04b *3/58*
U.S. Cl. 179—170 F **3 Claims**



A filter for a video amplifier of the type used to amplify a signal on a transmission line which also carries power for operating said amplifier comprises a tubular semiconductive ferrite member coated with barium titanate. An inner conductive layer is provided on the ferrite and an outer conductive layer on the barium titanate. A plurality of turns of insulated wire forms a winding which is connected to the inner conductive layer at a point which is also connected to the transmission line. The other end of the winding is connected to a power transformer for the amplifier. The video input of the amplifier is connected between the filter's outer conductive coating and the power transformer. In another embodiment, the outer and inner conductive coatings are split and the filter is connected so that an effective shunting capacitance is connected across the power transformer. Alternatively, two filters of the type including tubular ferrite members, barium titanate and conductive coatings are used.

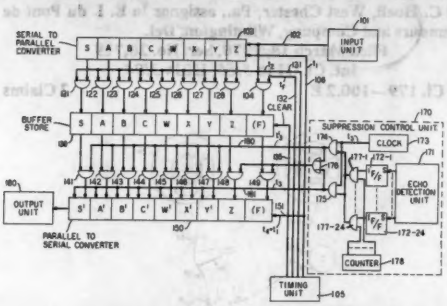
3,699,273

ECHO SUPPRESSION GATE FOR DIGITAL CODE WORDS INCLUDING NOISE INSERTION

William Lloyd Montgomery, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1970, Ser. No. 101,381
Int. Cl. H04b *3/20*
U.S. Cl. 179—170.2 **10 Claims**

Apparatus for suppressing echoes in digital speech transmission systems includes a serial-to-parallel converter, a buffer store and a parallel-to-serial converter. Digital code words propagating in serial form are first converted to parallel code words. The bits of the parallel code words are then supplied to the buffer store. An echo is suppressed by clearing the buffer store of the stored bits of the digital code word representing the echo and supplying logical signals representing substantially a zero amplitude signal to the parallel-to-serial converter. During the suppression of an echo code word, noise is automatically inserted into the transmission facility by allowing the logical signal in at least the last bit of the code word being suppressed to pass unaltered.

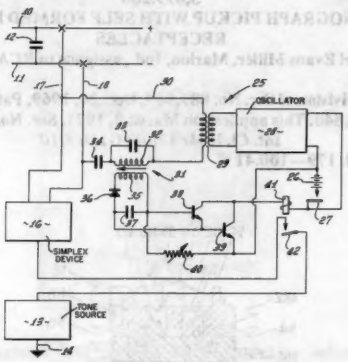


3,699,274

APPARATUS FOR IDENTIFYING TELEPHONE CABLE PAIRS

Richard L. Bennett, Saugus, Calif., assignor to Perkins Research & Mfg. Co., Canoga Park, Calif.

Filed July 22, 1971, Ser. No. 165,175
Int. Cl. H04m *3/26*
U.S. Cl. 179—175 **10 Claims**



An apparatus for identifying telephone cable pairs which may be in use by the customer without disturbing service, including a tone source, a simplex device and a switch circuit working in conjunction with the simplex device using the pair capacity to operate the circuit only when the proper electrical connection is made between the tapping wires of the device and each of the pair wires.

3,699,275

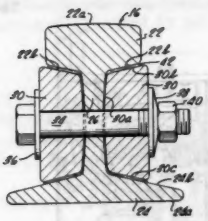
COMPOSITE ELECTRICAL CONDUCTOR

Cecil J. Mayo, Hillsborough, and Ronald J. Kilburg, San Carlos, both of Calif., assignors to Insul-8-Corp., San Carlos, Calif.

Filed Nov. 18, 1970, Ser. No. 90,701
Int. Cl. B60m *1/30*
U.S. Cl. 191—29 **6 Claims**

A pair of aluminum bars are bolted to the web of a steel rail having a generally I-shaped cross-section. The bars are con-

toured to fit within the recesses formed on each side of the rail to provide good electrical contact between the aluminum and the steel and a layer of conductive grease is positioned



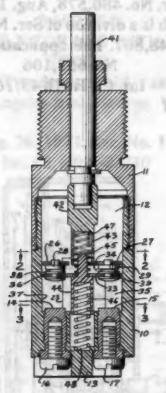
between the bar and the rail. The bars can be provided with deformable means for sealing the interface between the bar and the aluminum as the bars are drawn into engagement with the rail.

3,699,276

LINEAR PUSH PLUNGER ELECTRICAL SWITCH WITH TUBULAR SHROUD ARC PREVENTION MEANS

Namik O. Atakkaan, Buffalo Grove, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed April 5, 1971, Ser. No. 131,370
Int. Cl. H01h *33/06, 15/10*
U.S. Cl. 200—16 A **6 Claims**



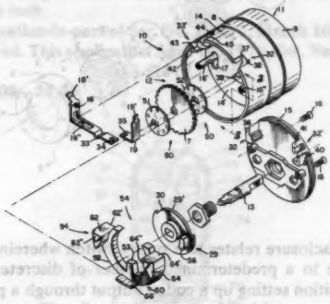
An insulated body defines a longitudinal cavity about an axis. A contact carrier moves axially within said cavity in the manner of a piston and defines compartments at opposite sides thereof. The carrier is electrically conductive and has contacts diametrically positioned. In each compartment there are two fixed contacts aligned with the movable contacts and actuating means is operatively connected to the contact carrier. This operating means includes springs at each side of the carriers and insulating members that shroud the springs as contact separation takes place in either direction.

3,699,277

TIMER WITH INTERNAL STOP MECHANISM COMPRISING ANNULAR RING STRUCTURE INTERFITTING COMPLEMENTARY HOUSING MEMBER

Paul J. Straub, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed June 11, 1971, Ser. No. 152,183
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38 R **11 Claims**



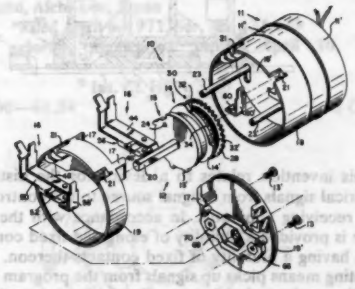
A stop means is sandwiched between two members carried by a rotating shaft, the stop means cooperating with a lug carried by one of the members to limit the shaft's rotation.

3,699,278

ELECTRICAL TIMER WITH IMPROVED RESILIENT CONTACT MOUNTING AT GANGED HOUSING SECTION COMPLEMENTARY INTERFACES

Lewis E. Jones, and Daniel W. Bernhardt, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sept. 28, 1970, Ser. No. 75,855
Int. Cl. H01h *7/08, 43/10, 1/28*
U.S. Cl. 200—38 R **8 Claims**



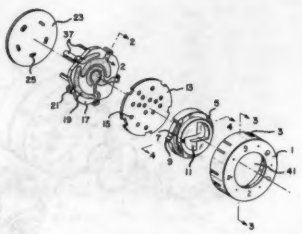
Stages of cam program means and electrical switching means responsive to the cam program means are carried in open ended housings which are disposed in axially aligned juxtaposition with the mating of projections and notches formed as part of the housings.

3,699,279

ROTARY SWITCH WITH IMPROVED PRINTED CIRCUIT CONTACT AND TERMINAL CONNECTION ARRAY

Joseph L. Lockard, and William Henry Rose, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1971, Ser. No. 119,273
Int. Cl. H01h 1/58, 19/58
U.S. Cl. 200—11 G 9 Claims



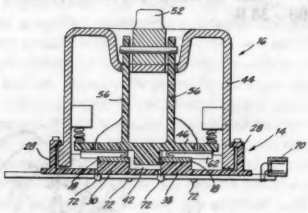
The disclosure relates to a rotary switch wherein a brush is rotatable to a predetermined number of discrete positions, each position setting up a coded output through a printed circuit by means of brushes and a code disc. The construction provides a very compact switch which is easily operated by a coin, key, finger or the like.

3,699,280

RECIPROCATING SWITCH ASSEMBLY FOR DISTRIBUTION PANELS

Reiner Mathias Hohenberger, Muehle, and Heinz Knitter, Schubler, both of Germany, assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Nov. 2, 1970, Ser. No. 85,843
Claims priority, application Germany, Oct. 31, 1969, P 19 55 020.0
Int. Cl. H01h 15/00
U.S. Cl. 200—16 A 7 Claims



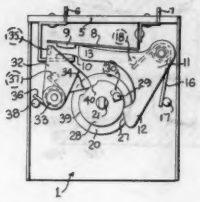
This invention relates to a device for the distribution of electrical signals from a signal source to the control members of a receiving apparatus. In accordance with the invention, there is provided a plurality of elongated fixed contact strips, each having a plurality of fixed contacts thereon. A first distributing means picks up signals from the program carrier and distributes these signals to a printed circuit board which distributes the signals to the various fixed contacts of the contact strips. A slide-contact member is slidably disposed on each of the contact strips for movement therealong, and have a plurality of slide-contacts which engage corresponding ones of the fixed contacts of the contact strips. In this manner, predetermined ones of the signals from the signal source can be selected and routed to the receiving apparatus by a second distributing means.

3,699,281

MANUAL PRESET INTERVAL TIMER WITH LATCH HOLDING MEANS FOR CONTACTS

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Sept. 7, 1971, Ser. No. 178,176
Int. Cl. H01h 7/08, 43/10
U.S. Cl. 260—38 R 7 Claims



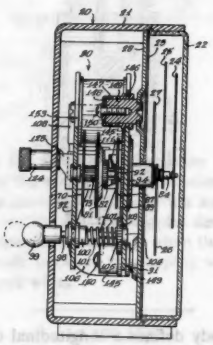
Slow or incomplete closure of manual preset interval timer contacts during the setting operation is avoided by a latch which prevents closure of the contacts until the timer knob has been turned far enough to insure complete closure of the contacts. This latch allows the contacts to assume very close proximity before releasing. This closes the contacts with a positive and rapid movement and avoids contact bounce.

3,699,282

INTERVAL TIMER HAVING MAGNETIC WALL PORTIONS

Ivar Jepson, South Duxbury, Mass.; John W. Morgan, Elmhurst, and James W. Richmond, Bensenville, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 480,578, Aug. 18, 1965, Pat. No. 3,389,452, which is a division of Ser. No. 322,218, Nov. 7, 1963, Pat. No. 3,248,867. This application July 10, 1967, Ser. No. 652,106
Int. Cl. H01h 43/18
U.S. Cl. 200—38 A 9 Claims

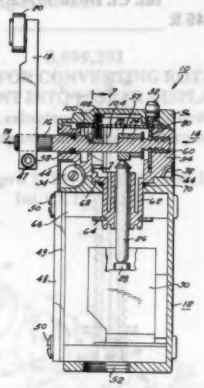


Timing device comprising a frame with magnetic wall portions and an electric motor having a rotor utilizing the magnetic wall portions for providing a flux path for flux produced by an electric winding associated with an axis displayed from the axis of the rotor.

3,699,283
ELECTRICAL LIMIT SWITCH

Martin D. Ustin, Pine Brook, N.J., assignor to Buchanan Electrical Products Corporation, Union, N.J.

Division of Ser. No. 567,172, July 22, 1966. This application Sept. 29, 1970, Ser. No. 76,567
Int. Cl. F16h *21/44*
U.S. Cl. 200—47 14 Claims

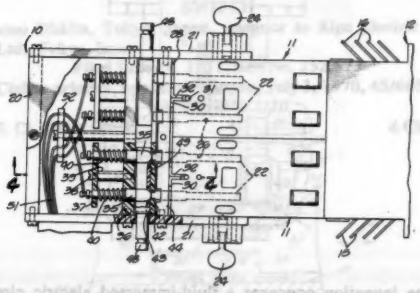


The device has an actuating arm which is rotated to actuate the switch. The position of the arm is infinitely adjustable with respect to the body of the device so as to make it possible to actuate the arm from numerous different directions. Also, the arm is adjustable, without disassembling the device, to provide three modes of switch operation; one in which the switch is operated only by clockwise rotation of the arm, a second in which only counter-clockwise arm rotation produces switch operation, and a third in which the switch is operated by rotation in either direction.

3,699,284
TAP SHOE ASSEMBLY FOR USE WITH WIRE TERMINAL STRIPS

Karl R. Anderson, Pasadena, Calif., assignor to John T. Thompson, Los Angeles and George W. Gillemot, Santa Monica, Calif.

Filed Aug. 26, 1971, Ser. No. 175,270
Int. Cl. H01r *33/30*
U.S. Cl. 200—51.04 17 Claims

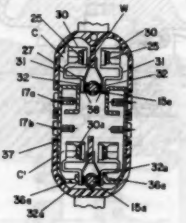


A gang connector for temporary use in making simultaneous connection to a multiplicity of pairs of conductors permanently soldered to the separate terminals of a terminal strip. The connector includes simple, positive means housed therein for making or breaking contact between any selected pair of conductors and terminals carried by the connector and readily connectable to cabling equipped with separable coupling means mateable with these terminals. The connector is specially designed with conductor prongs insertable into the test probe wells of individual line protectors customarily present on wire terminal strips. Guard strips extend along either side of these conductor prongs and include adjustable means for clamping the connector assembled to the terminal strip via its line protectors.

3,699,285
SAFETY ELECTRICAL RECEPTACLE

Ralph W. Leatherman, Vale, N.C., assignor to Glenn Bingham, Lawndale; Ken Mayhew, Cherryville; Henry Ritchie, Cleveland and Hugh Leatherman, Florence, all of, N.C., part interest to each

Continuation-in-part of Ser. No. 18,219, March 10, 1970, abandoned. This application Sept. 14, 1970, Ser. No. 72,190
Int. Cl. H01v *33/30*
U.S. Cl. 200—51.09 5 Claims

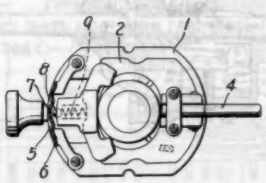


A safety electrical receptacle of the type receiving three wire grounding plugs, wherein the electrical circuit between the power supply terminal and the corresponding contact, to which the line voltage is fed, is normally open. Insertion of the grounding prong of the plug into the ground opening urges a movable portion of the corresponding contact into engagement with a fixed contact connected to the power supply terminal, thereby completing the electrical circuit from the terminal through the electrical contact elements and into the attachment plug blade. In one embodiment the grounding prong of the plug includes a tapered insulating jacket therearound to facilitate operation of the movable portion of the contact.

3,699,286
DIRECTIONAL SIGNALING MECHANISM FOR AUTOMOTIVE VEHICLE

Masaru Suzuki, Chiryu, and Yoshihiro Kawai, Nagoya, both of Japan, assignors to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed April 6, 1971, Ser. No. 131,659
Claims priority, application Japan, April 10, 1970, 45/35069
Int. Cl. H01h *3/18*
U.S. Cl. 200—61.34 2 Claims



A direction signalling apparatus for a vehicle has an actuating member which is movable manually from a neutral position to one of two operating positions for indicating selectively a left-hand or a right-hand turn, or to intermediate positions between the operative positions for signaling a change of lanes. The actuating member will be returned automatically to

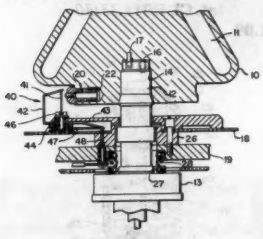
its neutral position from either of its intermediate positions upon release of the actuating member, but it will be returned from either of its two operating positions only upon backward rotation of the steering wheel.

3,699,287

SYSTEM FOR DETECTING EXCESSIVE CENTRIFUGE ROTOR OSCILLATIONS

Lawrence E. Stahl, San Mateo, and Lee Gropper, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc.

Filed April 28, 1971, Ser. No. 138,077
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 R **1 Claim**



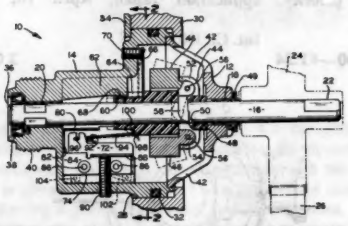
In a centrifuge including a centrifuge rotor and driving means for spinning the rotor at selected rotational speeds the improvement comprising a device for interrupting power to the driving means in the event of excessive rotor oscillations including an actuating means carried solely by the centrifuge rotor and switch means mounted in spaced relation to the lower peripheral portion of the rotor adjacent to the path of travel of the actuating means and in electrical circuit with the driving means.

3,699,288

SPEED RESPONSIVE SWITCH

Jackie E. Swoveland; Lothair Irvin, both of Hagerstown, and James A. Charles, Greens Fork, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed March 8, 1971, Ser. No. 121,952
Int. Cl. H01h *35/10*
U.S. Cl. 200—80 R **6 Claims**



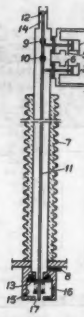
A speed responsive switch which is actuated at a first predetermined speed of rotation and deactuated at a second, but lower, pre-determined speed of rotation. A collar is urged axially by a flyweight governor and its movement is resisted by a leaf spring and the lever arm of an electrical switch which resists movement of the collar in only one direction.

3,699,289

OPERATING DEVICE FOR ELECTRIC SWITCHING APPARATUS FOR HIGH VOLTAGE

Sten Berneryd, and Hans Backskog, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 20, 1971, Ser. No. 181,872
Claims priority, application Sweden, Oct. 2, 1970, 13378/70
Int. Cl. H01h *33/42*
U.S. Cl. 200—148 R **9 Claims**



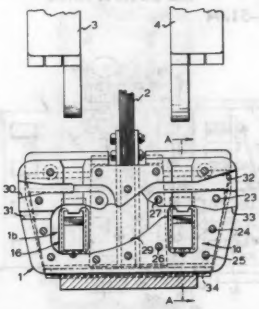
In an operating system for high voltage gas blast circuit breakers, the opening impulse is transmitted from earth to high potential by means of an insulating tension rod. A high initial acceleration of the rod is obtained by means of an electrodynamic operating device positioned at the lower end of the rod. This operating device comprises a stationary coil and an operating plate connected inductively to the coil and directly joined to the tension rod.

3,699,290

ELECTRIC CIRCUIT BREAKERS

George Caton, Ilkley, England, assignor to Yorkshire Switchgear and Engineering Co., Limited, Leeds, Yorkshire, England

Filed Oct. 18, 1971, Ser. No. 189,879
Claims priority, application Great Britain, Nov. 13, 1970, 54,152/70
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 L **10 Claims**



The invention concerns a fluid-immersed electric circuit breaker comprising first an second sets of fixed contacts each said set comprising a fixed main contact and a fixed arcing contact, an insulating carrier structure, a movable bridging contact carried on said insulating carrier structure and having first and second sets of movable contacts each set comprising a movable main contact and a movable arcing contact, said movable main and arcing contacts being movable to engage respective ones of said fixed main and arcing contacts, a fluid-

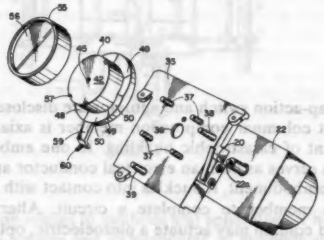
filled arc-quenching chamber housing said movable contact sets and having a restricted outlet positioned so that under pressure of gas generated by arcing within the chamber a stream of said fluid under pressure is directed across an arcing path between one of said fixed arcing contacts and the associated one of said movable arcing contacts. In accordance with the invention the said arcing path is surrounded by at least one loop of ferromagnetic material which has been found to improve quenching of the arc.

3,699,291

APPARATUS FOR CONVERTING ROTATIONAL DISPLACEMENT INTO LINEAR DISPLACEMENT

Bernard R. Danti, Lexington, and Paul E. Brefka, Southboro, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed April 1, 1971, Ser. No. 130,193
Int. Cl. H01h *3/42*
U.S. Cl. 200—153 L **12 Claims**



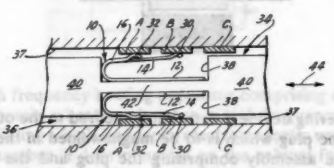
Apparatus for converting rotational displacement into linear displacement comprising a rotatable member and two sets of stationary members bearing each against one surface of said rotatable member. The rotatable member has two surfaces comprising a plurality of alternating oppositely inclined surfaces joined together to form a plurality of apices and the sets of stationary surfaces comprise posts adapted to register with one pair of oppositely inclined surfaces and one apex. For a given rotational displacement the posts contact at the same height of the inclined surfaces and the inclined surfaces are inclined in the same direction. This apparatus is useful as a means for actuating a timer to supply electrical power for a time interval while preventing accidental interruption of electrical power during the time interval.

3,699,292

SLIDABLE CONTACT MEMBER FOR MINATURE SWITCH

Masao Ohkita, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed June 14, 1971, Ser. No. 152,577
Claims priority, application Japan, July 3, 1970, 45/66533
Int. Cl. H01h *1/10*
U.S. Cl. 200—166 J **4 Claims**



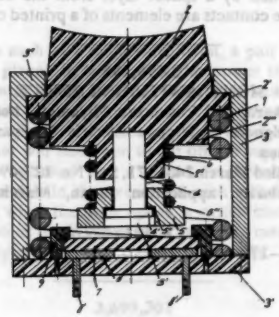
A contact member for use in a slide type miniature switch comprises an integral sheet metal body having a base portion and a plurality of resilient contact arms. The contact arms extend from the base portion to different lengths and are bent over substantially 180° and are provided at their ends with curved contact surfaces. The contact member is adapted to be received in a recess in a slide carrier whereby the contact surfaces are pressed selectively into sliding engagement with a plurality of fixed contacts mounted on the switch housing wall. The contact arms may be dimensioned to achieve either a shorting or non-shorting switch-over operation. The contact member may be conveniently fabricated from a single piece of sheet metal and is particularly suitable for mass production techniques.

3,699,293

KEY SWITCH FOR CHATTERLESS SWITCHING

Peter Portugall, Fischbach, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 31, 1970, Ser. No. 60,028
Claims priority, application Germany, Aug. 4, 1969, P 19 39 642.0
Int. Cl. H01h *1/50*
U.S. Cl. 200—166 H **10 Claims**



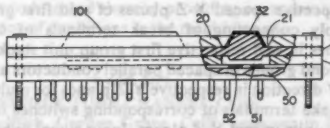
A normally open key switch for chatterless switching. The switching element is a silicone rubber part containing granular silver-plated, copper particles which normally lies in a loose relationship over a pair of separate contact plates. A compression member applies a deforming force to the switching element when the switch is actuated, causing a great decrease in effective resistivity of the switching element. The compression member is independently resiliently linked to the actuating button, permitting some button overtravel and thereby isolating the switching element from the full actuating force applied to the button.

3,699,294

KEYBOARD, DIGITAL CODING, SWITCH FOR DIGITAL LOGIC, AND LOW POWER DETECTOR SWITCHES

William B. Sudduth, Gloucester, Mass., assignor to Flex Key Corporation, Gloucester, Mass.

Continuation-in-part of Ser. No. 888,758, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 801,438, Feb. 24, 1969, abandoned. This application May 18, 1971, Ser. No. 144,453
Int. Cl. H01h *1/20*; H01n *1/50*; H01h *1/04*
U.S. Cl. 200—166 C **33 Claims**



Electric switches are described in which a resilient, electrically conductive, elastomeric member is spaced adjacent but apart from contact means; among features are the elastomeric connector: of sheet form; on metal contacts as a movable contact bridge; defining a simple and durable multiple switch

array including a keyboard, a digital coding assembly and a detector; and as the means, especially with proper selection of distributed conductive particles in the elastomer for limited conductivity, of eliminating the electrical effects of bounce in solid state electronic logic circuitry and the like. Fabrication of the switch as a simple, thin compact laminate using printed circuit boards is shown using the preferred silicone elastomer and carbon filler. In preferred embodiments pressure against conductive elastomer sheet means will cause it to connect to a contact element conductively and release of pressure will cause the sheet means to disconnect. The sheet means can be used as a floating connection for one or more circuit elements, and in this form has particular application in a keyboard assembly, particularly in connection with replaceable printed circuit boards and in digital coding techniques with a single printed circuit board. Preferably, the sheet means resiliently, reversibly deforms from first to second conditions, typically engaging the contacts in the deformed or bulged condition. Preferably in one condition the sheet means takes a planar form, positioned by a spacer layer from the contacts. And preferably the contacts are elements of a printed circuit.

3,699,295

SIGNAL SWITCHING DEVICE

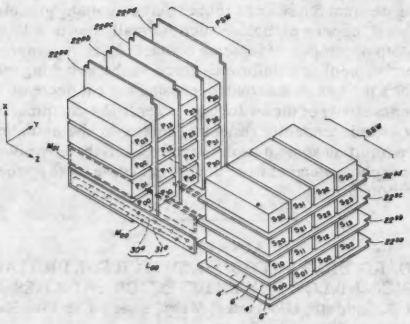
Takeo Shinohara, and Yoshikazu Miyamoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed March 24, 1971, Ser. No. 127,498

Claims priority, application Japan, March 27, 1970, 45/26379

Int. Cl. H01h *67/30*

U.S. Cl. 200—175 **1 Claim**



A signal switching device with a plurality of each of first and second groups of rectangular parallelopiped switching units arranged in X,Y, and Z directions. A plurality of first groups of spaced parallel conductors are disposed in said X direction in respective spaced X-Z planes of said first group units for multiply connecting of break terminals of corresponding switches in said respective first group unit stacks. A plurality of second groups of spaced parallel conductors are disposed in said Y direction in respective Y-Z planes for multiply connecting make terminals of corresponding switches of said second group units in said Y-Z planes. Input signal lines are disposed in parallel and connected to break terminals of said switches in respective first group units in said X-Z planes, while output signal lines are disposed in parallel and selectively connected to make terminals of switches of the second group units in the Y-Z planes, whereby a desired one of the input lines is connectable to a desired one of said output lines.

3,699,296

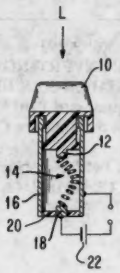
CATASTROPHICALLY BUCKLING COMPRESSION COLUMN SWITCH AND ACTUATOR

Richard H. Harris, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1971, Ser. No. 145,652

Int. Cl. H01h *13/28*

U.S. Cl. 200—67 DB **15 Claims**



A snap-action switch and actuator are disclosed in which a resilient columnar compression member is axially loaded to the point of catastrophic buckling. In one embodiment, the column serves as both an electrical conductor and a contact. In this embodiment, it buckles into contact with another conductive member to complete a circuit. Alternatively, the buckled column may actuate a piezoelectric, optical, or other signal producing means to produce signals used for switching or to close other contacts.

3,699,297

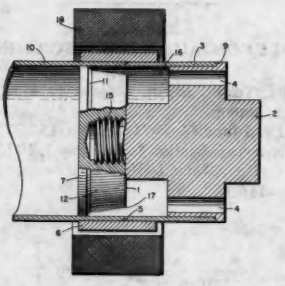
A CENTERING PLUG FOR MAGNETIC WELDING A PLUG IN THE END OF A TUBE

Michel Grin, Varese, and Francois Marchal, Cadrezzate, both of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Division of Ser. No. 95,317, Dec. 4, 1970, Pat. No. 3,627,980. This application June 10, 1971, Ser. No. 151,975

Int. Cl. B21j *5/08*

U.S. Cl. 219—9.5 **3 Claims**



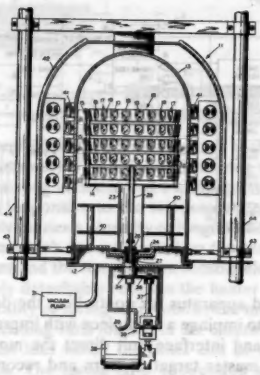
A centering device is detachably secured to the outside surface of the plug which is to be magnewelded in the end of a tube. The assembly comprising the plug and the centering device is then inserted in the tube until the outside surface of the plug reaches a position adjacent a circumferential notch on the tube. Current is then passed through a magnewelding coil surrounding the tube. The tube contracts radically, is welded onto the plug and snaps off along the notch. It is then only necessary to detach the centering member from the plug to complete the welding operation.

3,699,298

METHODS AND APPARATUS FOR HEATING AND/OR COATING ARTICLES

Thomas F. Briody, Bethlehem, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 601,885, Dec. 15, 1966, Pat. No. 3,659,552. This application Dec. 23, 1971, Ser. No. 211,432
Int. Cl. H05b 5/00
U.S. Cl. 219—10.49 7 Claims



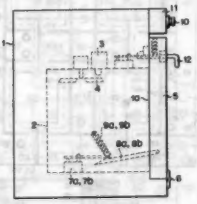
This invention relates to methods and apparatus for heating and/or coating articles and, in particular, to methods and apparatus for epitaxially depositing coatings of semiconductor material onto slices of such material. Accordingly, the general object of this invention is to provide new and improved methods and apparatus of such character.

3,699,299

HIGH FREQUENCY HEATING APPARATUS

Shiro Umezu, Kanagawa-ken; Tetsuo Hashimura, Tokyo, and Akira Sekido, Kanagawa-ken, all of Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan

Filed May 27, 1971, Ser. No. 147,460
Claims priority, application Japan, May 30, 1970, 45/52967
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 13 Claims



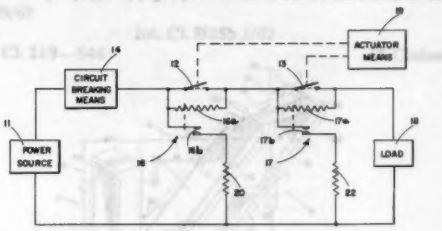
In a high frequency heating apparatus comprising a cabinet defining therein a heating chamber, a high frequency oscillator for radiating a high frequency electromagnetic wave in the heating chamber, a door mounted on the cabinet for closing the heating chamber, a door operating handle, and a locking member housed in the cabinet for locking the door in the closed position, there is provided a switch disposed in the cabinet for controlling the operation of the high frequency oscillator, and means interlocked with the handle for operating the switch to deenergize the high frequency oscillator when the locking device releases the door.

3,699,300

SYSTEM FOR DETECTING SAFETY SWITCH FAILURE

Christian E. Buerki, Fullerton, Calif., assignor to Norris Industries Inc., Los Angeles, Calif.

Filed Nov. 30, 1971, Ser. No. 203,220
Int. Cl. H05b 9/06; H02h 5/04, 1/00
U.S. Cl. 219—10.55 7 Claims



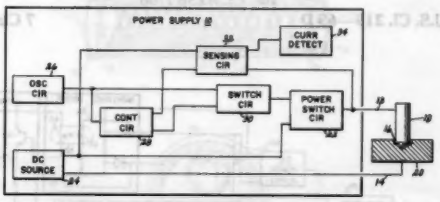
In a device such as a microwave oven, a pair of interlock switches are placed in series with the power supply to the energy generator, these switches being interlocked with the oven door which seals the microwave compartment such that when the door is opened, both switches which are in series with each other will also open to cut off the supply of power. Each of the switches has a detection circuit connected thereacross so that in the event that such switch should fail and not open when the door opens, a switch mechanism will be actuated so as to actuate circuit breaking means to interrupt the supply of power to the energy generator.

3,699,301

EDM GAP SENSING

Jerry E. Losey, Ft. Thomas, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 8, 1971, Ser. No. 196,313
Int. Cl. B23p 1/08, 1/14
U.S. Cl. 219—69 C 5 Claims



An apparatus is disclosed for sensing conditions in a machining gap by detecting a current flow therethrough. The normal application of low power pulses from an oscillator circuit to a power switching circuit is delayed for a predetermined period of time. During this period of time, a sensing signal is applied to the machining gap through a high resistance gap sensing circuit; and the current through the sensing circuit is detected thereby providing an accurate and reliable indicator of conditions in the machining gap.

3,699,302

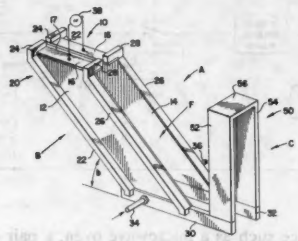
SINGLE TURN CHANNEL COIL

Richard A. Griffith, Garden Grove, Calif., assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Feb. 24, 1971, Ser. No. 117,931
Int. Cl. H05b 5/18
U.S. Cl. 219—10.57 7 Claims

A method and apparatus for inductively heating at least a portion of the length of an elongated workpiece wherein the

inductor includes a pair of parallel spaced apart conductors interconnected at one end so as to define a workpiece pass. The conductors are angularly disposed coplanar with the pass so that the workpiece is progressively preheated as it travels therethrough. Spaced from the exit area of these heating conductors is a uniforming heating conductor extending transversely around the direction of the pass over at least that portion of the element which has been progressively preheated. To



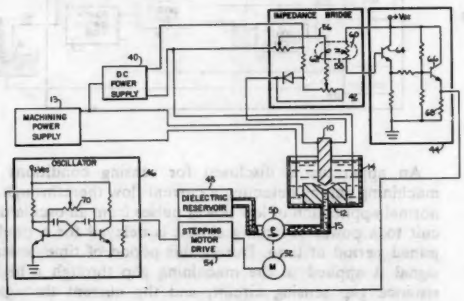
provide efficient and uniform heating, the width of the uniforming heating conductor is maintained between one to one and a half times the thickness of the element. A relationship of less than this will not provide simultaneous uniforming heating for a workpiece and a relationship of greater than this decreases the flux density such that increased electrical energy is required as well as undesirably heating the adjacent workpiece.

3,699,303

EDM PROCESS A METHOD AND APPARATUS FOR CONTROLLING THE FLOW RATE OF DIELECTRIC AS A FUNCTION OF GAP IMPEDANCE

Harry D. Kauffman, and Malcolm F. Davis, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 15, 1970, Ser. No. 80,965
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 D **7 Claims**



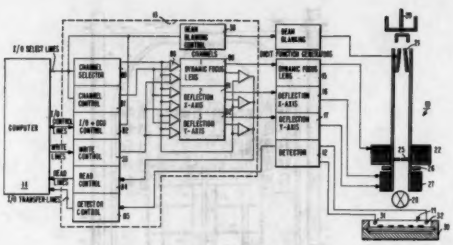
A method and apparatus for use in an EDM process for controlling the flow rate of dielectric through a machining gap as a function of the magnitude of gap impedance. An apparatus is provided for detecting variations in the magnitude of gap impedance and producing an output signal representative thereof. The variations in gap impedance are used to change the flow rate of dielectric through the gap. The flow rate may increase thus cleansing the gap of debris, or it may decrease and create a limited concentration of debris to facilitate the breakdown of the gap.

3,699,304

ELECTRON BEAM DEFLECTION CONTROL METHOD AND APPARATUS

Edwin C. Baldwin, Jr., and Warren R. Wrenner, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1969, Ser. No. 884,889
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB **7 Claims**



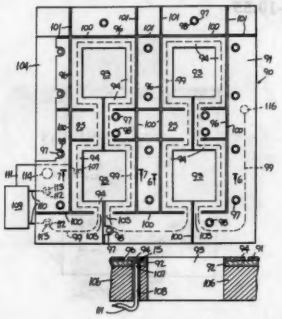
Method and apparatus for controlling the deflection of an energy beam to impinge a workpiece with improved accuracy. A computer and interface unit direct the movement of the beam over a master target to learn and record addresses of impingement areas corresponding to those on a workpiece. Differential current flow in two conductive elements is used to determine accurate location of the address. Upon the substitution of a workpiece for the master target, impingement addresses can be selected without additional corrective deflection circuits.

3,699,305

HEAT SEALING APPARATUS

John E. Reenstra, 10 Ronnie Road, Wayne, N.J., and Martin Malone, 27 Sunrise Drive, Hawthorne, N.J.

Division of Ser. No. 726,436, May 3, 1968, Pat. No. 3,617,696.
This application April 30, 1970, Ser. No. 43,627
Int. Cl. H05b *1/00*
U.S. Cl. 219—200 **8 Claims**



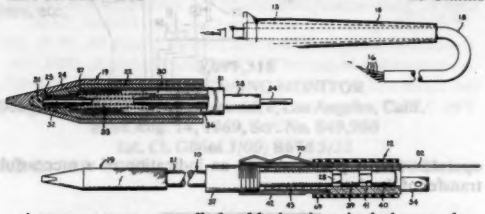
A heat sealing tray is comprised of a thin sheet of heater element material bonded to an insulating substrate and a rigid backing member. The sheet is etched out in a pattern defining a heating current path. An automatic temperature limiting control circuit is connected to the sheet. The circuit operates in full wave configuration and controls the partial cycle conduction of current through the heating path. A temperature sensor signals the circuit to remove the current through the path when a predetermined temperature is reached.

3,699,306

TEMPERATURE CONTROLLED SOLDERING IRON

Thomas Ellwood Finch, Acton, Ind., assignor to General Electric Company

Filed March 1, 1971, Ser. No. 119,498
Int. Cl. H05b *1/02*; B23k *3/04*; H01r *11/02*
U.S. Cl. 219—241 15 Claims



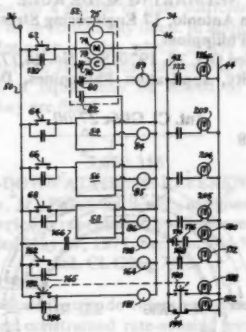
A temperature controlled soldering iron includes an elongated heater assembly with a hollow soldering tip at one end containing a heating element and a temperature sensing element which is responsive to the temperature of the tip. The heater assembly carries a plurality of longitudinally spaced exposed contacts which are connected to the terminals of the heating element and the temperature sensing element. A connector assembly detachably receives the heater assembly and includes a plurality of spring strip conductors mounted in longitudinally extending slots formed in the exterior surface of a hollow insulator into which the other end of the heater assembly extends. The spring strip conductors are captivated and secured in position on the insulator by an insulating sleeve and have terminal portions exposed beyond the end of the connector assembly and have contact portions which are detachably electrically connected to the contacts on the heater assembly when the latter is inserted into the connector assembly. The connector assembly is releasably retained in a bore of an insulating handle through which extends a power cord having conductors which are connected to the terminal portions of the spring strip conductors.

3,699,307

OVEN CONTROL

Emanuel Malkin, Louisville, Ky., assignor to Mass Feeding Corporation, Elk Grove Village, Ill.

Filed Aug. 26, 1970, Ser. No. 66,925
Int. Cl. H05b *1/02*
U.S. Cl. 219—492 10 Claims



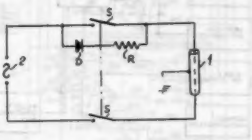
In an oven control, a plurality of individual timers are provided for controlling the heating interval of the oven. Each timer is independently selectable, and a control switch is associated with each timer for regulating the heat production rate of the oven when that timer is selected. A second control switch is associated with each timer to control the heat production rate when the oven is only half full. At the end of the timed interval, the temperature of the oven is quickly lowered to a warming temperature.

3,699,308

ELECTRICAL HEATING ELEMENTS

Eric Hutchinson, Wideopen, Newcastle upon Tyne, and Gordon Hetherington, North Shields, both of England, assignors to Thermal Syndicate Limited, Wallsend, Northumberland, England

Filed Oct. 13, 1970, Ser. No. 80,447
Claims priority, application Great Britain, Oct. 16, 1969, 50889/69
Int. Cl. H05b *3/02*
U.S. Cl. 219—546 18 Claims



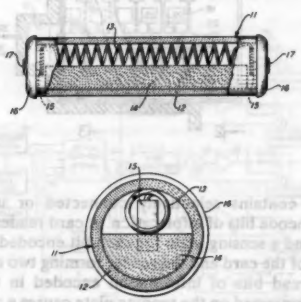
A method and apparatus for improving the "apparent" resistance of an electrical heating element of the type comprising an axial resistance element of the type comprising an axial resistance element insulated from a conducting sheath by a refractory material wherein the refractory material is subjected to an electrolysing D.C. potential applied between the element and the sheath.

3,699,309

DIRECTIONAL INFRARED HEATING ELEMENT

Richard H. Eck, 352 Pines Lake Drive East, Wayne, N.J.

Filed Dec. 3, 1970, Ser. No. 94,688
Int. Cl. H05b *3/44*
U.S. Cl. 219—553 2 Claims

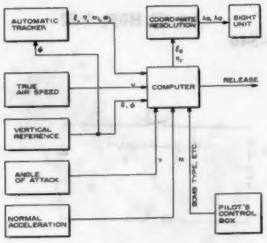


A radiant heater that provides uniform directional disposition of heat includes an elongated cylindrical tubular enclosure of heat resistant vitreous material pervious to infrared radiation, such as VYCOR. A preformed semicylindrical elongated support rod extends longitudinally in the enclosure and provides an uninterrupted generally flat support surface extending diametrically across the enclosure. A single helical resistance element of Kanthal is disposed in the portion of the enclosure not occupied by the support rod. The resistance element extends longitudinally of the support rod and enclosure and is in tangential and direct contact with the flat surface of the support. The support rod is formed of a compressed fibrous material having a low coefficient of thermal conductivity, such as a fibrous aluminum oxide and silicon dioxide composition known as FIBERFRAX.

3,699,310
ANGULAR RATE BOMBING SYSTEM

Roy D. Cole, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 6, 1970, Ser. No. 87,519
Int. Cl. G06g 7/80
U.S. Cl. 235—61.5 D **5 Claims**

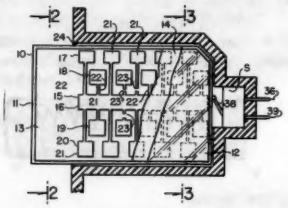


An angular rate bombing system (ARBS) which utilizes angular rate and angle measurements from an automatic target tracker, pitch and roll information from a standard vertical gyro, true airspeed data and angle of attack information to compute an azimuth lead angle to release ordnance at the correct elevation lead angle.

3,699,311
CODED CARD AND READER THEREFOR

Robert A. Dunbar, Swampscott, Mass., assignor to Remvac Systems Corporation, Woodside, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,114
Int. Cl. G06k 7/08; G11b 23/00
U.S. Cl. 235—61.11 H **6 Claims**



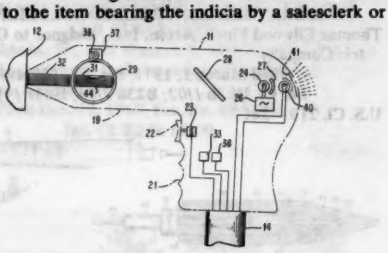
A card contains selectively connected or unconnected plates to encode bits of information. A card reader has a sending plate and a sensing plate for each bit encoded in the card, the plates of the card and the reader forming two capacitors in series to read bits of information encoded in the card. A potential impressed on the sending plate causes a charge redistribution and a momentary current flow which is sensed by a high impedance sensing circuit connected to each sensing plate, the momentary current flow and resulting voltage only being present to be sensed when the plates encoding a bit of information in the card are connected. The sending plates in the card reader and one of the plates encoding each bit of information in the card may be formed as single larger plates.

3,699,312
CODE SCANNING SYSTEM

John E. Jones, and Paul V. McEnroe, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 18, 1971, Ser. No. 125,653
Int. Cl. G06k 7/14
U.S. Cl. 235—61.11 E **10 Claims**

A scanning system for reading coded indicia on merchandise for providing input data to an automated retail sales station in which the scanning mechanism is hand held in fixed relationship to the item bearing the indicia by a salesclerk or

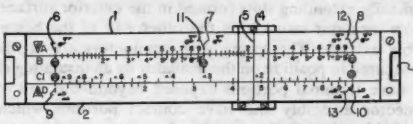


operator who is provided with an indication of a successful transfer of the data.

3,699,313
SLIDE RULE WITH OPERATIONAL GUIDANCE AND DECIMAL POINT LOCATION MEANS

Wendell Y. Huo, 6112 North Damen Avenue, Chicago, Ill.

Continuation-in-part of Ser. No. 802,830, Feb. 27, 1969, abandoned. This application May 3, 1971, Ser. No. 139,770
Int. Cl. G06g 1/02
U.S. Cl. 235—64.3 **5 Claims**

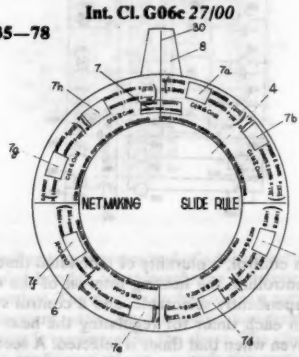


A logarithmic scale slide rule having means for readily determining operational direction and decimal location, comprising a system of oppositely facing brackets enclosing each 1 to 9.9999 scale range, and indicia symbols, whose first or second shape has one characterization to indicate the value "1" and another characterization to indicate the value of "0", said symbols being associated with certain of said brackets in such a manner as to indicate a plus or minus value whereby the sum of the values of said symbols encountered in the solution of a given problem will represent the power of 10, for the problem solution.

3,699,314
NETMAKING SLIDE RULE

Victorino T. San Antonio, 17 Engineering Street, Project 8-C, Quezon City, Philippines

Filed Oct. 28, 1970, Ser. No. 84,772
Claims priority, application Philippines, Dec. 17, 1969, 10990
Int. Cl. G06c 27/00
U.S. Cl. 235—78 **10 Claims**



This novel slide rule is a circular calculating device which satisfactorily facilitates the mechanical application of the

processes and formulas relevant to the net-making industry. It expedites computation for such quantities like tuck-in or take up rate for actual joining of strips of netting to determine the taper angle, bar angle, half-mesh angle, line length netting dimensions, hanging coefficients in water, estimates the desired patterns for the actual cutting and braiding of netting to shape, and converts linear measures, yarn thickness numbers, etc.

3,699,315

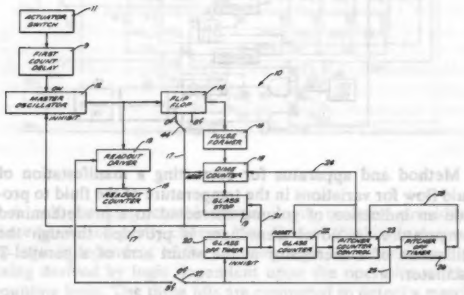
FLUID DISPENSING MONITOR

Douglas J. Upton, 18740 Devonshire, Los Angeles, Calif.

Filed Aug. 14, 1969, Ser. No. 849,980

Int. Cl. G06m 3/00; B67d 5/22

U.S. Cl. 235—92 FL **16 Claims**



A device for monitoring the volume of liquid dispensed through a valve and for indicating the equivalent monetary value of the amount of liquid dispensed even through the liquid may be dispensed in glasses and pitchers having different prices per unit volume and even though a different amount of liquid may be required to properly fill consecutive glasses or pitchers. The present fluid dispensing monitor includes a readout which indicates the monetary value of the glass or pitcher before the container is completely filled and ceases operation for a period of time sufficient to enable the glass or pitcher to be completely filled. In addition, the present monitor includes a time delay which delays incrementing of the readout after the start of the dispensing of liquid so that small amounts of liquid may be added to the glasses or pitchers after they are filled.

3,699,316

STRAPPED-DOWN ATTITUDE REFERENCE SYSTEM

Louis A. Lopes, Jr., Pasadena, Calif., assignor to The United States of America as represented by the Secretary of Navy

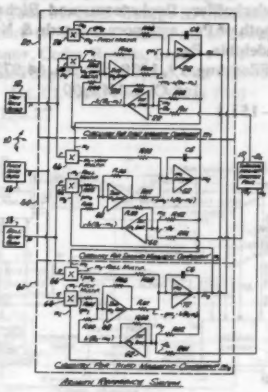
Filed May 19, 1971, Ser. No. 144,933

Int. Cl. G06g 7/78

U.S. Cl. 235—150.25 **4 Claims**

A "strapped-down" attitude reference system, that is one which uses three constrained rate-sensing gyros rather than free gyros. In addition, three accelerometers are used to obtain a vertical reference, and two magnetometers are used to obtain the azimuth of the reference system. The invention operates by maintaining two vectors, one aligned with the earth's gravity vector and the other with the local geomagnetic field. The components of the two vectors with respect to body-fixed orthogonal axes are continuously computed by integration of appropriate equations. Implementation of the invention is exemplified by an analog system, but may be accomplished in a digital manner.

The invention provides an attitude reference for vehicles in the earth's gravitational field, such as aircraft, tanks, sub-



marines, and torpedoes. These vehicles undergo short term maneuvers in which the reference provided by gravity is lost because of the vehicle acceleration.

3,699,317

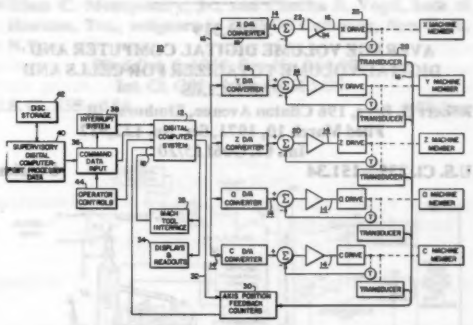
SAMPLED DATA NUMERICAL CONTOURING MACHINE CONTROLLER APPARATUS AND METHOD PROVIDABLE WITH ON LINE CAPABILITY FOR CONTOUR CORNERING DECELERATION AND ACCELERATION

Alan E. Middleditch, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 22, 1970, Ser. No. 39,940

Int. Cl. G05b 15/02, 21/02

U.S. Cl. 235—151.11 **92 Claims**

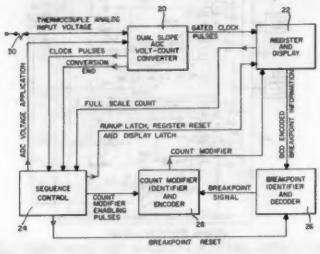


A numerical contouring controller employs ramped velocity commands for pre-corner slowdown and post-corner speedup in the relative movement between the controlled machine tool and a workpiece. The controller includes a digital computer which generates a command position trajectory. The computer operates in a closed position loop at a predetermined sampling frequency to compare accumulated position feedback data and the command position and thereby to generate command data to velocity loop controls which accurately position the machine tool slides. A program system operates the computer to make and implement the motion command determination including path speed change determinations and to make and implement nonmotion command determinations for machine tool, data input and machine operator interfacing.

3,699,318
INCREMENTAL SLOPE METHOD FOR OPTIMUM CONTINUOUS DIGITAL LINEARIZATION

Victor S. Underkoffler, Doylestown, and Richard B. White, Lansdale, both of Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Filed Aug. 19, 1970, Ser. No. 64,977
Int. Cl. G06f 9/00
U.S. Cl. 235—151.1 18 Claims

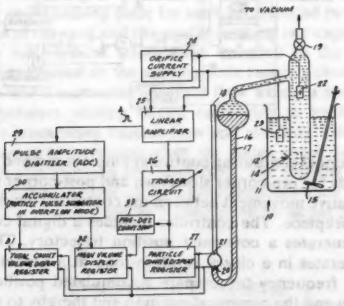


An incremental slope method for optimum continuous digital linearization is performed utilizing a programmed digital computer to determine the straight line segments best approximating a nonlinear function. By incrementing the slope of a straight line segment at each breakpoint on or near the curve of the nonlinear function, the difference between the value of the dependent variable on the function and the value of the dependent variable on the straight line segment for different slopes may be determined. By minimizing this difference and maximizing straight line segment length, the best approximating straight line segment is determined. In this manner, a linearized approximating function may be obtained for any set of data points stored in the computer corresponding to any nonlinear function such as a thermocouple curve. The straight line approximating segments with their corresponding preset values of slope and intercept are then utilized to linearize an analog-to-digital converter.

3,699,319
AVERAGE VOLUME DIGITAL COMPUTER AND DIGITAL VOLUME TOTALIZER FOR CELLS AND PARTICLES

Robert H. Berg, 196 Clinton Avenue, Elmhurst, Ill.

Filed March 10, 1971, Ser. No. 122,917
Int. Cl. G06f 15/20
U.S. Cl. 235—151.34 6 Claims

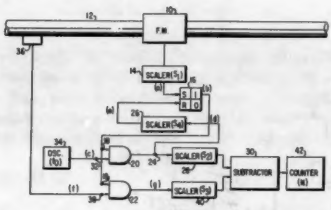


An apparatus for deriving average volume and total volume data from particles in a flow of liquid metered through an orifice includes a display of mean particle volume and total particle volume and count. The mean particle volume is the quotient of the totalized particle volume of a specific number of particles divided by that same number. The total particle volume and count provided by the same apparatus can be used to confirm the mean particle volume measurement.

3,699,320
TEMPERATURE COMPENSATED LIQUID METERING SYSTEM AND METHOD

Carl W. Zimmerman, and George V. Copland, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 20,640, March 18, 1970, and a continuation-in-part of Ser. No. 750,675, July 5, 1968, Pat. No. 3,566,685, and a continuation-in-part of Ser. No. 704,403, Feb. 9, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 106,997
Int. Cl. G01f 1/08, 1/00
U.S. Cl. 235—151.34 20 Claims

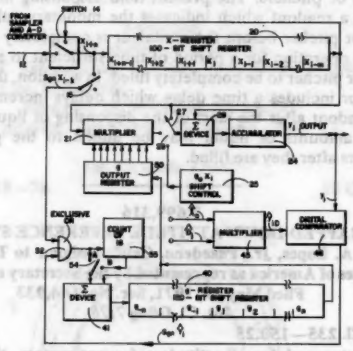


Method and apparatus for correcting a manifestation of fluid flow for variations in the temperature of the fluid to provide an indication of volume corrected to a predetermined temperature. A novel transducer is provided through the utilization of a thermistor in the shunt arm of a parallel-T oscillator.

3,699,321
AUTOMATIC ADAPTIVE EQUALIZER IMPLEMENTATION AMENABLE TO MOS

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed April 1, 1971, Ser. No. 130,129
Int. Cl. H04b 3/04, 1/62
U.S. Cl. 235—152 11 Claims



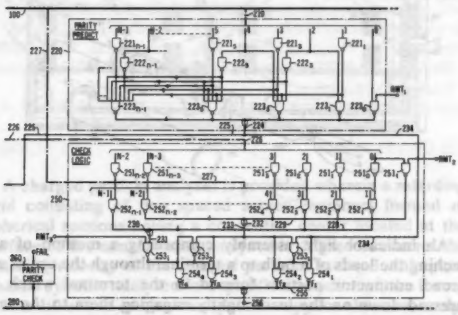
The present invention is an adaptive equalizer which utilizes a first shift register to store received signal samples and a second shift register to store gain settings. The serial output from the first shift register is parallel multiplied with the gain settings stored in the second register to achieve equalization of a received digital data transmission signal. The gain settings in the second register are updated to automatically equalize by utilizing an incremental control signal which is derived from the system's input signal and the received digital data, using cross-correlation implemented iteratively.

3,699,322

SELF-CHECKING COMBINATIONAL LOGIC COUNTER CIRCUIT

Robert Charles Dorr, Plainfield, Ill., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed April 28, 1971, Ser. No. 138,074
Int. Cl. G06f *11/10*
U.S. Cl. 235—153 10 Claims



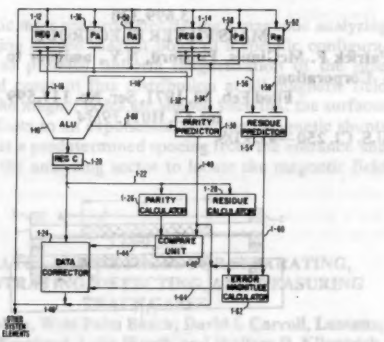
A self-checking combinational logic counter providing three predicted parity change bits. One of the bits is derived by logic independent of the counting logic, the other two bits being derived by logic dependent upon the operation of the counting logic. The three bits are compared to detect a match indicating an accurate prediction of a parity change or retention of original parity.

3,699,323

ERROR DETECTING AND CORRECTING SYSTEM AND METHOD

Harry J. Reinheimer, Rockville, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1970, Ser. No. 100,976
Int. Cl. G06f *11/10*
U.S. Cl. 235—153 6 Claims



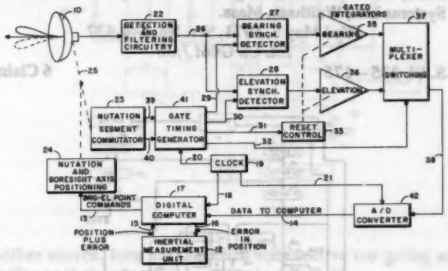
In a digital computer having both arithmetic and logical computational capabilities, an error location and correcting system is disclosed. Errors are located through the use of parity techniques and the errors thus located are corrected through the use of residue techniques.

3,699,324

ENERGY SOURCE TRACKING SYSTEM EMPLOYING DRIFT-LINE TECHNIQUE

Walter R. Iliff; John M. Holt; George E. Chadima, all of Cedar Rapids; Robert G. Brown, Ames, all of Iowa, and Collins Radio Company, Cedar Rapids, Iowa

Filed Sept. 17, 1970, Ser. No. 72,910
Int. Cl. G06f *15/50*; G01s *7/46*
U.S. Cl. 235—150.27 7 Claims



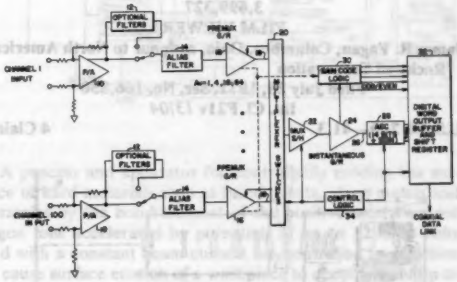
A tracking system approach which, unlike that of systems employing closed loop tracking techniques, points the boresight axis of an antenna at a computed future position of a radiating energy source. The source is allowed to drift through the conical scanning beam, during which time-energy detection measurements are made on a periodic basis. A computer receives the energy measurements and computes therefrom the equation of the best straight line corresponding to the error versus time relationship, whereupon the slope and intercept of this fitted line are utilized to compute pointing error. The system is then periodically updated on the basis of this pointing error.

3,699,325

TIME-SHARED INSTANTANEOUS GAIN-RANGING AMPLIFIER

William C. Montgomery, Jr., and Charles B. Vogel, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Oct. 9, 1969, Ser. No. 864,998
Int. Cl. G01v *1/00*; G06f *5/00*
U.S. Cl. 235—154 6 Claims



One-hundred low-frequency analog signal channels having a very large dynamic range, may be amplified to at least half of full scale a 14 bit analog to digital converter without distortion by an amplifier system that includes an instantaneous gain-ranger, a preamplifier for each channel, a filter system for each channel, a premultiplexer gain-ranging amplifier for each channel, and a multiplexer. The instantaneous gain-ranger consists of a series of binary amplifier stages, threshold detecting circuitry and logic circuitry. The output is taken from the first unsaturated amplifier. The preamplified and premul-

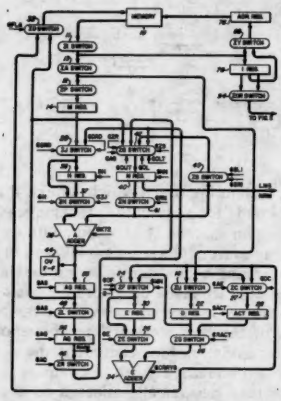
tiplexer gain-ranging amplifier are connected into the system ahead of the multiplexer and provide a sufficient signal-to-noise ratio to mask the noise introduced into the system by the multiplexer. The output of the system is typically digitized.

3,699,326

ROUNDING NUMBERS EXPRESSED IN 2'S COMPLEMENT NOTATION

Jerry L. Kindell, Phoenix, and Leonard G. Trubisky, Scottsdale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 5, 1971, Ser. No. 140,437
Int. Cl. G06f *7/38*
U.S. Cl. 235—175 **6 Claims**



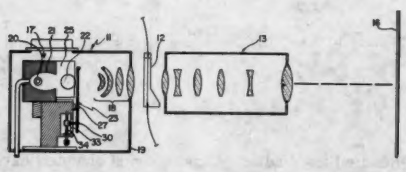
Rounding apparatus is disclosed which provides consistent rounding of positive and negative numbers in 2's complement representation for floating point operations on binary digital computers. In the disclosed embodiment of the invention, a general purpose computer is described in which apparatus is provided for performing the normal arithmetic and logical operations required for data processing. The computer is augmented by additional apparatus for modifying floating point operands so that consistent results are obtained in processing both positive and negative numbers, primarily during store operations.

3,699,327

FILM VIEWER

James R. Fagan, Columbus, Ohio, assignor to North American Rockwell Corporation

Filed July 28, 1971, Ser. No. 166,850
Int. Cl. F21v *13/04*
U.S. Cl. 240—41.3 **4 Claims**



A film viewer having a radiation conversion and control device for improved image brightness and image resolution. The device comprises a elongated open sided reflector of elliptical cross-section having an elongated circular cylindrical collector lens adjacent the open side. An elongated diffuser area is position on the surface of the lens to spread the light issuing from the lens.

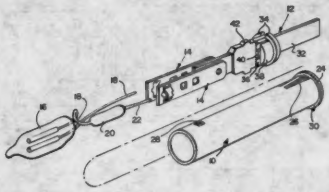
An iris diaphragm is positioned adjacent the collector lens for controling the amount of light passing to the film to be viewed.

3,699,328

INDICATOR LIGHT ASSEMBLY

Robert T. Murray, Needham, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed May 17, 1971, Ser. No. 144,120
Int. Cl. H01r *5/10, 11/08;* F21v *19/00*
U.S. Cl. 240—52.1 **2 Claims**



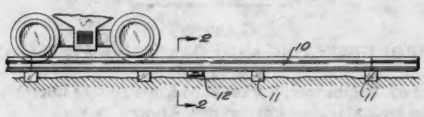
An indicator light assembly comprising a method of attaching the leads of a bulb to a terminal through the use of an arced connector portion formed in the terminal which is pressed down on the leads tightly engaging them to the terminal.

3,699,329

ELECTRO-MAGNETIC RAILWAY TRACK

Eugene M. Cybart, 10230 South McGraw Drive, Oak Creek, Wis.

Filed Dec. 16, 1970, Ser. No. 98,745
Int. Cl. B61k *7/10*
U.S. Cl. 246—182 **4 Claims**



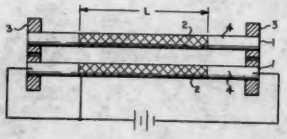
Electro-magnetic means energizing a rail of any length or an electro-magnet of appropriate length fixed laterally on a rail to slow or stop railway cars in a train marshalling or switch yard.

3,699,330

MASS FILTER ELECTRODE

Patrick F. McGinnis, Pittsford, N.Y., assignor to The Bendix Corporation

Filed Feb. 22, 1971, Ser. No. 117,599
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 DS **16 Claims**



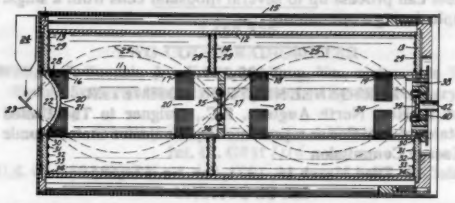
A mass filter having glass electrodes which are at least partially coated with a continuous vapor deposited or sputtered thin metallic film of predetermined thickness or thicknesses. The electrodes are arranged about a central axis and receive electrical potentials that create a time periodical electric field therebetween to separate ions having different mass-to-charge ratios.

3,699,331

DOUBLE PASS COAXIAL CYLINDER ANALYZER WITH RETARDING SPHERICAL GRIDS

Paul W. Palmberg, 50 West 93rd Street, Minneapolis, Minn.

Filed Aug. 27, 1971, Ser. No. 175,575
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 AE 7 Claims



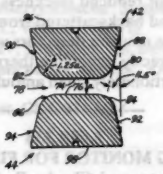
A charged particle analyzer is provided wherein a retarding grid consisting of two spaced screen members formed of spherical sections having a concentric center located at the surface of the sample being analyzed is utilized to control the entering velocity of the charged particles into a double pass, coaxial cylinder analyzer. In a specific embodiment, the invention is utilized in an electron spectroscopy for chemical analysis (ESCA) apparatus.

3,699,332

MAGNETIC MASS SPECTROMETER WITH SHAPED, UNIFORMLY SATURATING MAGNETIC POLES

Charles W. Hull, Sierra Madre, and Charles R. McKinney, Monrovia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 27, 1970, Ser. No. 15,186
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 ME 16 Claims



A magnetic mass spectrometer having a magnetic analyzing sector utilizing shaped magnet poles of a specific configuration so as to produce uniform magnetization of the pole material and constant flux distribution at all magnetic field strengths. The magnet poles are shaped such that the surfaces thereof conform to an exponential function. Magnetic shunts are located at a predetermined spacing from the entrance and exit end of the analyzing sector to locate the magnetic field boundary.

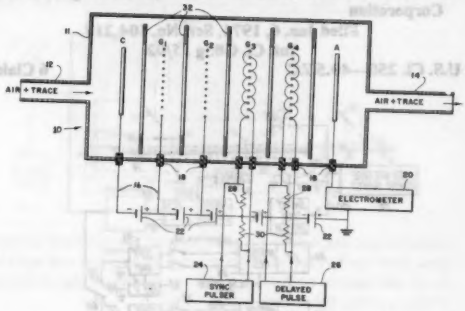
3,699,333

APPARATUS AND METHODS FOR SEPARATING, CONCENTRATING, DETECTING, AND MEASURING TRACE GASES

Martin J. Cohen, West Palm Beach; David I. Carroll, Lantana; Roger F. Wernlund, Lake Worth, and Wallace D. Kilpatrick, North Palm Beach, all of Fla., assignors to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Oct. 23, 1968, Ser. No. 777,964
Int. Cl. H01j 39/34; B01d 59/44; H01j 37/08
U.S. Cl. 250—41.9 TF 43 Claims

Apparatus and methods for sorting and detecting trace gases which undergo ion-molecule reactions. Positive or negative ions of the trace gas are formed by ion-molecule reactions between the molecules of the trace gas and primary ions from another source. Ions are classified by selective ion gating according to their velocity in an electric drift field.

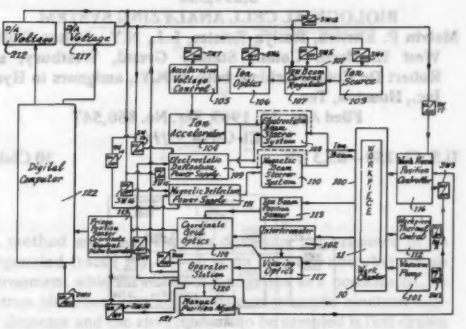


3,699,334

APPARATUS USING A BEAM OF POSITIVE IONS FOR CONTROLLED EROSION OF SURFACES

Murray F. Cohen, Roslyn Heights, and Michael Tarasevich, Bayville, both of N.Y., assignors to Kollsman Instrument Corporation, Syosset, N.Y.

Filed June 16, 1969, Ser. No. 833,335
Int. Cl. H01j 37/28
U.S. Cl. 250—49.5 TE 6 Claims



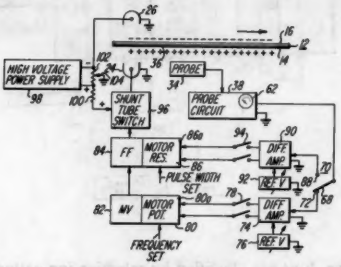
A process and apparatus for controllably eroding the surface of hard materials such as fused quartz, glass, metals and ceramics by the bombardment of the positive ions. Focused argon ions accelerated by potentials of up to 120,000 volts and with a constant beam current are controlled in direction to cause surface erosion of a workpiece to accuracies of up to one-one hundredth of a wavelength of green light. The workpiece is moved at a controlled rate in combination with the control of the beam direction to obtain a controlled erosion pattern over the surface of the workpiece. In another embodiment, an intensity modulated beam current is used. An electron beam is directed at the workpiece in a pattern which surrounds the ion beam to prevent the building up of a positive charge on the work surface. The progress of the erosion is observed and measured by an interferometer system. The movement of the ion beam and workpiece can follow a programmed automatic sequence.

3,699,335

APPARATUS FOR CHARGING A RECORDING ELEMENT WITH AN ELECTROSTATIC CHARGE OF A DESIRED AMPLITUDE

Edward Charles Gialmo, Jr., Princeton, N.J., assignor to RCA Corporation

Filed Jan. 6, 1971, Ser. No. 104,217
Int. Cl. G03g 15/02
U.S. Cl. 250—49.5 ZC 6 Claims



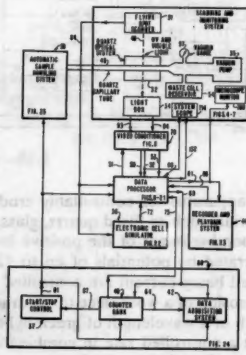
Apparatus for charging a recording element includes a corona generating device that is energized with pulses of a constant amplitude. Circuitry is provided for obtaining an error signal, if the total charge applied to the recording element tends to vary from a preset desired amplitude, and for controlling the width or the frequency of the pulses in response to the error signal to regulate the applied charge. The method of charging the surface of the recording element to a desired amplitude in a given time includes applying an electrostatic charge to the recording element in pulses and adjusting either the width or the frequency of the pulses to obtain the desired amplitude.

3,699,336

BIOLOGICAL CELL ANALYZING SYSTEM

Melvin P. Ehrlich, Roslyn Estates, L.I., N.Y.; Milton Stoller, West Hartford, Conn.; Stanley Grand, Westbury, and Robert De Cote, Flushing, both of N.Y., assignors to Hycel, Inc., Houston, Tex.

Filed Aug. 15, 1969, Ser. No. 850,547
Int. Cl. G01n 33/16
U.S. Cl. 250—83.3 UV 30 Claims



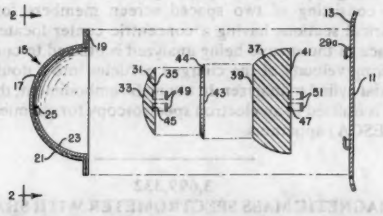
A biological cell analyzing system which is capable of automatically categorizing unstained biological cells as normal or non-normal. The cells are made to flow through a transparent tube in single file and are scanned with a mixture of ultra-violet and visible light. The cytoplasm and nucleus of each cell absorb ultra-violet radiation to different degrees, and the emergent light signal, as modulated by the scanned cells, is detected, amplified, and extended to a data processor which logically analyzes the signal from each cell on a real-time basis. The visible light signal is subtracted from the ultra-violet light signal to improve the signal/noise ratio of the latter, and to automatically cancel out non-biological debris. A number of acceptance tests are electronically performed on each cell, and if any of the tests is failed the cell is categorized as non-normal. Ambiguous conditions, resulting for example from the clumping of cells, are identified and separately counted. The system can process up to several thousand cells from a single sample during a one-minute run.

3,699,337

PERSONNEL NEUTRON DOSIMETER

John E. Hoy, North Augusta, S.C., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed March 16, 1971, Ser. No. 124,685
Int. Cl. G01t 3/00
U.S. Cl. 250—83.1 7 Claims



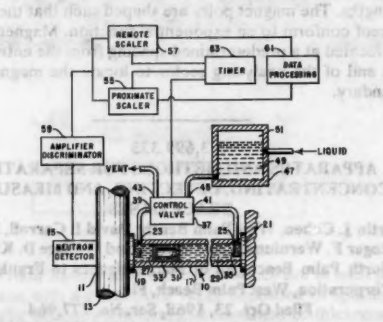
A dosimeter is disclosed for measuring the neutron dose equivalent for spectra of widely different energy distributions. A hemispherical mass of neutron moderating material is divided into two segments by a layer of thermal neutron absorbing material. Each segment has a thermal neutron detector at its base surface. Another layer of thermal neutron absorbing material covers the curved surface of the hemispherical mass but has a portion of reduced thickness at the apex. Neutrons passing through and backscattered from the wearer are monitored by one of the neutron detectors while the second detector corrects for directly impinging thermal neutrons that contribute a disproportionately small amount to dose.

3,699,338

OSCILLATING MONITOR FOR FISSILE MATERIAL

Norman P. Baumann, and Charles E. Ahlfeld, both of Aiken, S.C., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 5, 1971, Ser. No. 169,227
Int. Cl. G01t 3/00
U.S. Cl. 250—83.1 12 Claims



A device for monitoring fissile material has a neutron source that oscillates between a location near and a location remote from a neutron detector. The detector is adjacent to

suspected fissile material and is shielded by hydrogenous material from the remote location. The detector output is transmitted to analytical instrumentation for determining prompt and delayed neutron count or the phase angle lag between measured neutron flux and the source oscillation. From these determinations, the reactivity of fissile fuel and the concentration of fissile material in deeply subcritical storage facilities can be obtained.

3,699,339

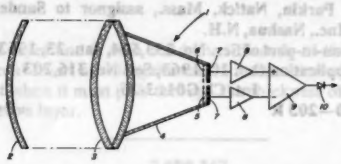
TWO-COLOR RADIOMETER

William J. Taczak, Jr., Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 7, 1971, Ser. No. 132,036

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 H **8 Claims**



The inventive radiometer is capable of measuring the radiant energy of a target or of an event, including a transient event, in two spectral regions with identical fields of view. The invention may be used for target identification or for discriminating against false targets, such as solar radiation.

3,699,340

COMPTON SPECTROMETER HAVING PRIMARY AND SECONDARY DETECTORS WITH LOW AND HIGH ATOMIC NUMBERS, RESPECTIVELY

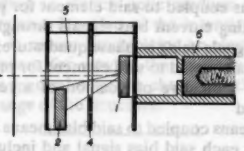
Harald Peter Hick, and Rudolf Pepelnik, both of Vienna, Austria, assignors to Osterreichische Studiengesellschaft fur Atomenergie G.m.b.H., Vienna, Austria

Filed Oct. 27, 1969, Ser. No. 869,734

Claims priority, application Austria, Oct. 31, 1968, A 10646/68

Int. Cl. G01t 1/24

U.S. Cl. 250—83.3 R **3 Claims**



A compton spectrometer having semiconductors which intercept the primary and secondary or back scattered radiation. One of the detectors is made of a material having a low atomic number and the other detector is made of a material of high atomic number.

3,699,341

MUZZLE FLASH DETECTOR

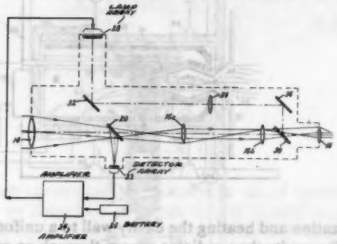
John H. Quillinan, Ambler, and Edward F. Mackey, West Chester, both of Pa., assignors to General Electric Company

Filed Sept. 23, 1968, Ser. No. 761,624

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 H **13 Claims**

An optical sight with muzzle flash detector for providing a visual indication on the sight image of a muzzle flash of a firearm by passive detection of the IR radiation coming from the flash. A filter separates infrared radiation from the visual light coming through the sight and aims it at a fixed matrix of PbS detectors. The resulting signal activates a corresponding



lamp or lamps in a lamp matrix similar to that of the detectors to form a visible light image passing through the sight so as to give an indication of the location of a firearm's muzzle flash.

3,699,342

METHOD AND APPARATUS FOR DETECTING TRACER GAS

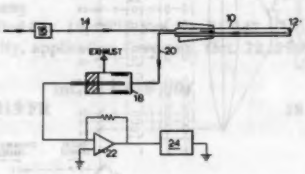
Anthony Jenkins, and RIchard Charles Cornell, both of Fowlmere, near Royston, England, assignors to Analytical Instruments Limited, Royston, England

Filed Aug. 13, 1970, Ser. No. 63,571

Claims priority, application Great Britain, April 27, 1970, 20,180/70

Int. Cl. G01t 1/18

U.S. Cl. 250—83.6 FT **3 Claims**



A method and apparatus for detecting the presence of an halogenated tracer gas, which is an electron absorber, in an environment which is itself, or comprises as a constituent, an electron absorber. The apparatus comprises an electron capture detector and the environment to be sampled is first drawn through a membrane which has a greater permeability to the tracer gas than the remainder of the environment before being carried into the detector by a carrier gas. This results in a diminution of the concentration of any electron capture agents present in the environment and which if drawn into the detector could swamp the effect of the tracer gas.

3,699,343

CONDENSATION HEATED BLACK BODY RADIATION SOURCE

Bernard Stein, Andover, Mass., and Sheridan Davis, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

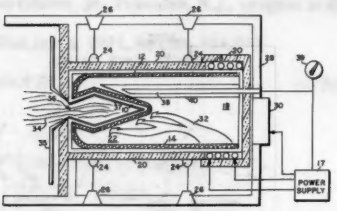
Filed Aug. 19, 1969, Ser. No. 851,203

Int. Cl. H05b 1/00

U.S. Cl. 250—85 **16 Claims**

An isothermal black body radiation source comprises a double reentrant radiating cavity disposed within a heat pipe. Wicking material surrounds the outer surface of the radiating cavity and the heat pipe sidewalls. Heat is supplied to the heat

pipe by an electrical winding or other suitable heating means, thereby vaporizing a working fluid. The vapors are condensed on the cavity outer walls thereby releasing their latent heat of



vaporization and heating the cavity wall to a uniform temperature. The cavity then radiates energy through an exit aperture. In an alternative embodiment the radiating cavity is disposed within a reflux tube.

3,699,344

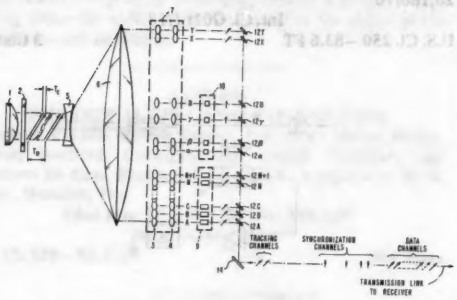
OPTICAL PULSE COMMUNICATION SYSTEM USING A PSEUDO-RANDOM SEQUENCE FOR SYNCHRONIZATION

Elisabeth M. Rutz, Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1971, Ser. No. 119,276

Int. Cl. H04b 9/00; H04j 3/00

U.S. Cl. 250—199 **16 Claims**



In a time-division multiplexed optical communication system, a coded optical waveform is transmitted with the data sequence. The waveform follows a type of pseudo-random sequence termed an incoherent coded word. At the receiver, the coded and data sequence are demultiplexed into separate channels and combined with an identical reference sequence generated at the receiver. Each combined reference and demultiplexed pulse of the sequences is detected at an associated coincidence detector. The demultiplexing means also presents each pulse of the multiplexed beam to each coincidence detector. If the reference and demultiplexed sequences are out of synchronization, the reference sequence may combine with these unwanted pulses, thereby yielding false outputs from the detectors. The properties of the pseudo-random coded sequence are used to ensure that this situation will be noted and the false outputs ignored.

When the demultiplexed and reference sequences are in synchronization, the combined coded synchronization pulses of the demultiplexed and reference sequences are received simultaneously at their associated coincidence detectors in the synchronization channels. The outputs from the detectors are fed to a single photomultiplier-matched filter. The filter is conditioned to generate a significant output only when it receives all of the outputs from the detectors in the synchronization channels simultaneously.

If the demultiplexed and reference sequences are out of synchronization, the properties of the pseudorandom coded sequence ensure that not more than one reference and demultiplexed pulse of said coded synchronization sequence is received simultaneously at the matched filter. Under this condition, the filter will generate virtually no output.

To ensure that optical pulses of the data sequence do not combine with the synchronization sequence at the receiver, means are provided for excluding all pulses except synchronization pulses from the synchronization channels.

Means are also provided for initially establishing the synchronization between the received and reference sequences and also for automatically synchronizing the sequences if they are out of sync for less than the period between multiplexed pulses.

3,699,345

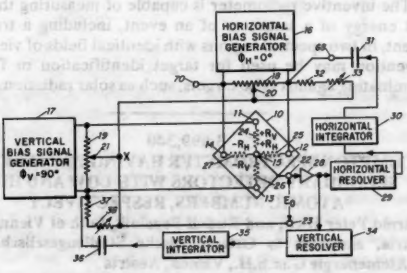
SENSING AND TRACKING APPARATUS

William J. Parkin, Natick, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 253,504, Jan. 23, 1963. This application Oct. 10, 1963, Ser. No. 316,203

Int. Cl. G01s 3/78

U.S. Cl. 250—203 R **7 Claims**



1. Sensing apparatus, comprising:

a radiation responsive, variable impedance detector element;

biasing means coupled to said element for providing a pair of alternating current bias signals through said element, said bias signals being in phase quadrature;

output means coupled to said element for providing an output signal indicative of position of a remote radiation source; and

balancing means coupled to said bias means and said output means for each said bias signal and including a variable reference voltage level to balance said quadrature and output signals with respect to said reference level at a plurality of selected rates.

3,699,346

PHOTO-CONDUCTIVE IMAGE INTENSIFIERS

Mervyn Geoffrey Harwood, Bromley, and John Schofield, Coulsdon, both of England, assignors to U.S. Philips Corporation

Filed Dec. 7, 1970, Ser. No. 95,437

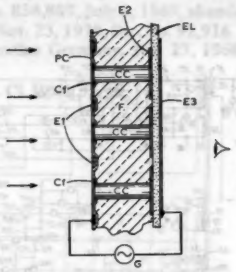
Claims priority, application Great Britain, Dec. 11, 1969, 60,556/69

Int. Cl. H01j 31/50

U.S. Cl. 250—213 **8 Claims**

Coupling conductors are disposed in electrical contact between the input photo-conductive layer and the output electro-luminescent layer of a photo-conductive image intensifier

panel so that the photo-conductive layer acts only to an extremely small depth of light penetration and therefore photocurrent occurs mainly at the input surface of the photo-con-



ductive layer and is then conducted directly to the electroluminescent layer, avoiding the severe attenuation of the photocurrent when it must pass through the thickness of the photoconductive layer.

3,699,347

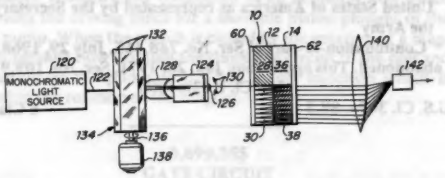
VARIABLE ELECTRO-OPTIC FILTER AND READOUT APPARATUS

William Raymond Buchan, Lincoln, and Ralph Edward Aldrich, Woburn, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Division of Ser. No. 820,417, April 30, 1969, Pat. No. 3,612,655. This application July 6, 1971, Ser. No. 159,916

Int. Cl. G02f 1/16

U.S. Cl. 250—217 R **20 Claims**



An electro-optic filter is disclosed having a Fabry-Perot structure including an electro-optic medium whose index of refraction varies as a function of the intensity of an electric field applied to it, means for applying an electric field to the medium, and means for varying the intensity of the electric field to shift the spectral response characteristic and optimum transmissivity range of the structure.

3,699,348

RADIATION SENSITIVE DEVICE FOR THE SUCCESSIVE INVESTIGATION OF SEVERAL SAMPLES

Gunther Hocheri, Aalen, Germany, assignor to Carl Zeiss-Stiftung, Wuerttemberg, Germany

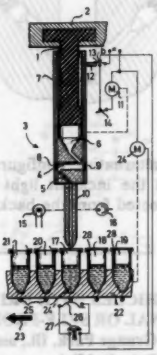
Filed Aug. 6, 1971, Ser. No. 169,758

Claims priority, application Germany, Aug. 14, 1970, P 20 40 481.3

Int. Cl. G01n 21/26

U.S. Cl. 250—218 **6 Claims**

An arrangement for the successive investigation of several samples by light passing through the sample comprises a vertically disposed flow cell the upper end of which is fixedly connected to a vertical tube surrounding a fixedly mounted piston. The lower end of the flow cell has a suction nipple attached thereto which upon downward movement of the flow cell relative to the fixed piston is immersed in one of the sample vessels which are arranged on a horizontally movable conveyor so that the liquid sample therein is drawn into the flow cell which is provided in its circular wall with two diametrically opposed windows through which the measuring light is adapted to pass for impinging a photo cell. An electric motor moves the vertical tube and therewith the flow cell and suction nipple thereon upwardly and downwardly and during the up-



ward movement discharges the sample liquid in the flow cell into the vessel from which it was taken, whereupon the sample vessels are moved horizontally one step further until the next sample vessel comes into a position directly below the suction nipple on the flow cell.

3,699,349

ARRANGEMENT FOR DETERMINING FRAME LENGTHS ON FILM STRIPS

Rudolf Paulus, and Hans-Peter Huber, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 16, 1970, Ser. No. 81,347

Claims priority, application Germany, Oct. 22, 1969, P 19 53 014.4

Int. Cl. G01b 7/04

U.S. Cl. 250—219 FR **18 Claims**

One or more photoresistors, arranged to detect light passing through the film strip, cause varying signal voltages, the maximum voltages of which are stored and compared with the instantaneous signal voltages to produce a signal corresponding to the format of the film just examined.

3,699,350

RADIANT ENERGY MARK SENSOR

Daniel O. Holdaway, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

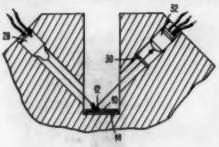
Filed Dec. 28, 1970, Ser. No. 101,704

Int. Cl. G02f 1/18

U.S. Cl. 250—225 **9 Claims**

The radiant energy mark sensor herein makes use of Brewster's Law and adds a polarizing screen in the light path to improve the radiant energy contrast between marks and a background. The incident beam of light strikes the background at or near Brewster's angle. A polarizing screen is

placed in the path of the reflected light. Light reflected from the background will be polarized, and the polarizing screen can null out that light. Light reflected from marks will not be polarized, and some of the light will be passed by the polarizing screen. In an alternative configuration, the polarizing screen is placed in the incident light path to control the amount of light reflected from the background and from the mark.



3,699,351

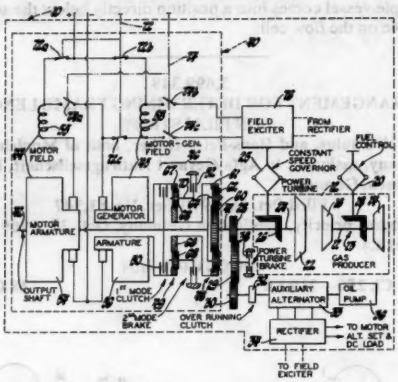
BI-MODAL VEHICLES WITH DRIVE MEANS FOR EXTERNAL OR SELF-PROPULSION

Albert N. Addle, La Grange Park, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1971, Ser. No. 168,068

Int. Cl. B60l *11/14*

U.S. Cl. 290—14 **8 Claims**



A bi-modal vehicle, such as a rail car, is provided in a preferred embodiment with a propulsion turbine and an electro-mechanical transmission arranged to drive the vehicle either from the turbine or from an external source of electrical power. The electro-mechanical transmission includes a split torque feature whereby, in the self-propelled mode, some of the turbine torque is delivered mechanically to the output shaft while the remainder passes through an electrical path including a motor and generator combination. In the external electric drive mode, both the generator and motor of the transmission are utilized as drive motors directly driving the output shaft. Numerous additional features are included.

3,699,352

MULTI-RANGE REGULATED DC POWER SUPPLY

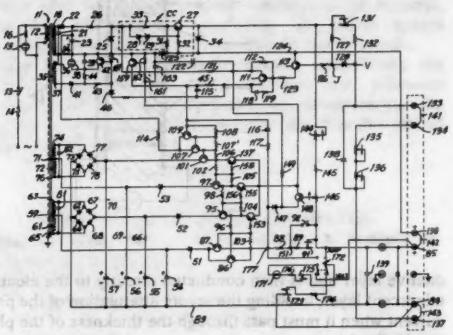
Arthur E. Silver, Wantagh, N.Y., assignor to Power Designs, Inc., Westbury, N.Y.

Filed March 8, 1971, Ser. No. 121,995

Int. Cl. H02j *1/00*

U.S. Cl. 307—75 **10 Claims**

A regulated DC power supply which has a multiplicity of unregulated DC sources and a multiplicity of electronic series resistance elements whose resistance is varied with the DC input source or load changes to maintain the voltage or current at the load at a constant level, an electronic control system being provided which automatically selects the



required unregulated source and the series resistance element most suited to provide the desired voltage or current at the load.

3,699,353

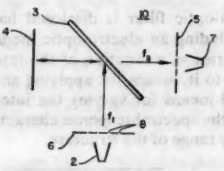
METHOD AND APPARATUS FOR GENERATING THIRD HARMONIC SIGNALS

George W. Bechtold, Tucker, Ga.; Vernon E. Derr, Boulder, Colo., and James C. Wiltse, Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Army

Continuation-in-part of Ser. No. 748,465, July 29, 1968, abandoned. This application Jan. 26, 1971, Ser. No. 109,917

Int. Cl. H02m *5/06*

U.S. Cl. 307—88.3 **6 Claims**



This invention relates to a method and apparatus for obtaining multiple resonant cavities that are simultaneously resonant at a fundamental frequency and its third harmonic frequency and to a metal plate beam splitter used in a resonator to separate the fundamental signal from the third harmonic signal. The beam splitter comprises a series of plates made of metal or metallized dielectric; the dielectric being plated to obtain high surface conductivity. The plates are dimensioned so as to give the desired attenuation of the fundamental frequency and are spaced relative to each other in such a manner as to mask the transverse area occupied by the field of the resonator. The beam splitter is inserted into the interaction region of a doubly resonant Fabry-Perot cavity or other cavity resonator and may be used in the microwave through submillimeter region.

3,699,354

CONTROL FOR ELECTRO-MAGNETIC PUMP

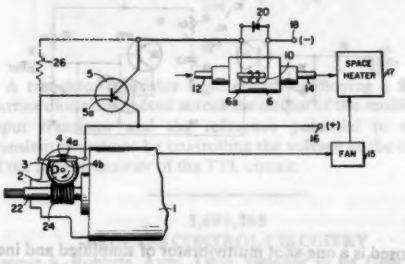
Siegfried Koflnk, Zell, (Neckar), Germany, assignor to J. Eberspacher, Esslinger/Neckar, Germany

Continuation of Ser. No. 838,885, July 3, 1969, abandoned. This application Nov. 23, 1970, Ser. No. 92,916

Claims priority, application Germany, July 27, 1968, P 17 63 735.3

Int. Cl. H01h *35/00*

U.S. Cl. 307—120 8 Claims



An apparatus for controlling the operation of an electromagnetic pump, particularly a fuel pump, for a device such as a combustion heater having an electric motor driven fan for the air supply to the heater includes a gear driven by the motor which drives a rotatable magnetic. The magnet is mounted so that it influences the opening and closing of a switch which is arranged in a circuit controlling the base of a transistor. The transistor is electrically connected to an actuating coil which provides the driving force for a movable piston plunger of the fuel pump. When the switch is closed by the rotation of a magnet it permits flow through the transistor circuit to the coil and actuation of the pump to provide a fuel injection which is timed to the rotation of the magnet.

3,699,355

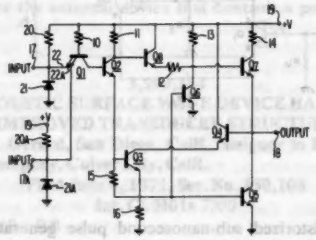
GATE CIRCUIT

Charles Felix Madrazo, North Palm Beach; Edwin Maxwell Fulcher, and Kevin Patrick McDonagh, both of Lake Park, all of Fla., assignors to RCA Corporation

Filed March 2, 1971, Ser. No. 120,268

Int. Cl. H03k *19/34*

U.S. Cl. 307—215 13 Claims



Gating circuit having a feedback network which provides output voltage clamping and medium to high speed operation. In addition, the feedback network provides transient overdrive which reduces output signal falltime.

3,699,356

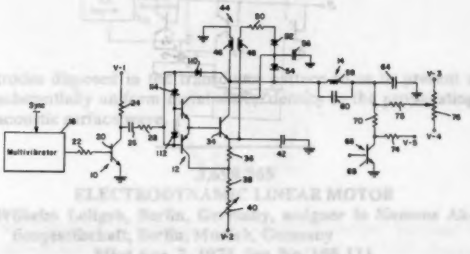
RESONANT SWEEP GENERATOR

Ted W. Berwin, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 4, 1971, Ser. No. 174,572

Int. Cl. H03k *4/08*

U.S. Cl. 307—228 14 Claims



A resonant sweep generator comprising a diode for coupling a voltage source to a reactance load during a first interval of each operating cycle; a transistor for coupling the voltage source to the load during a second interval of each operating cycle; a compensation bias arrangement which provides improved sweep linearity by forward biasing the diode so as to cause the voltage levels applied to the load during the first and second intervals to be substantially equal; and a drive circuit which allows increased efficiency and speed of operation by controlling the transistor so that it does not saturate.

3,699,357

PEAK DETECTION CIRCUITS

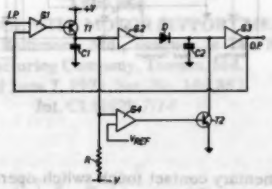
George Howard Lloyd, Hertfordshire, England, assignor to Marconi Instruments Limited, London, England

Filed March 8, 1971, Ser. No. 121,769

Claims priority, application Great Britain, March 7, 1970, 11,031/70

Int. Cl. H03k *17/28, 17/30*

U.S. Cl. 307—235 A 8 Claims



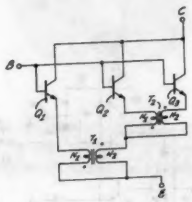
A peak detection circuit has two capacitive storage stages. The first storage stage has a fixed discharge time constant, and the second storage stage has two switchably selectable discharge time constants, one of which is less than that of the first storage stage and the other greater. During measurement of a peak level the greater time constant is used to provide an accurate measurement, but between successive measurements the lesser time constant is selected to reduce the waiting time normally required between such measurements.

3,699,358

CURRENT SHARING PARALLEL TRANSISTOR CIRCUIT

Bruce L. Wilkinson, Torrance, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed June 14, 1971, Ser. No. 152,548
Int. Cl. H03k 17/56
U.S. Cl. 307—242 4 Claims



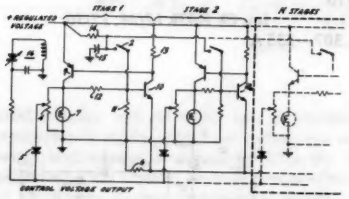
An improved circuit is provided effectively to connect a plurality of power transistors in a parallel connection for handling power levels beyond the capabilities of the individual transistors. The circuit includes a transformer intercoupling the emitters of the individual transistors for current sharing purposes, and for insuring equal current division among the individual transistors during continuous operation thereof, and during intermittent "on-off" operation thereof when the transistors are used for switching purposes.

3,699,359

ELECTRONIC LATCHING DEVICE

Rufus F. Shelby, Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed April 20, 1971, Ser. No. 135,544
Int. Cl. H03k 17/00
U.S. Cl. 307—252 K 5 Claims



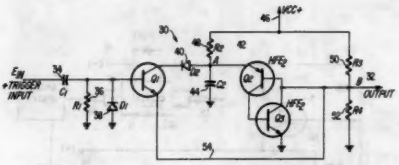
A momentary contact touch switch operates an electronic latching circuit which applies a constant direct current to a potentiometer. The potentiometer arm produces a controlled output voltage suitable for the remote electronic control of circuits having voltage sensitive variable capacitor tuning elements. A plurality of such devices operate as a touch-button tuning control with the potentiometers acting as the tuning controls to preset the touch-buttons. The voltage outputs of the potentiometers are fed through isolating diodes to a common control voltage output line so that only the potentiometer that is energized will be electrically connected to the output. All of the latching circuits are connected to a common element so that when any one circuit is actuated by a touch button, all of the others are deenergized.

3,699,360

ONE-SHOT MONOSTABLE MULTIVIBRATOR

Charles W. Ragsdale, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Army

Division of Ser. No. 789,694, Jan. 8, 1069, Pat. No. 3,587,694.
This application Aug. 15, 1969, Ser. No. 850,403
Int. Cl. H03k 3/284
U.S. Cl. 307—273 7 Claims



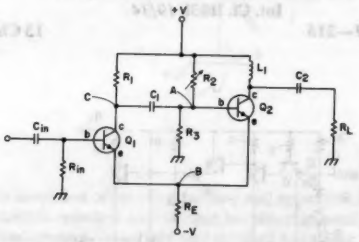
Disclosed is a one-shot multivibrator of simplified and inexpensive construction which produces a constant width output pulse and which once triggered is not affected by additional trigger pulses until after the timing cycle is completed. A charged capacitor and resistor maintain a pair of transistors conducting and the transistors change state when current flow is diverted from them through a third transistor in response to a triggering signal. The multivibrator output is connected by a negative feedback lead to the third transistor. Also disclosed is a rate monitoring portion of an electrical heart monitor incorporating the multivibrator.

3,699,361

SUB-NANOSECOND PULSE GENERATOR CIRCUIT

Brian Richard Bryden, Kanata, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 23, 1971, Ser. No. 183,178
Int. Cl. H03k 3/284, 3/29
U.S. Cl. 307—273 2 Claims



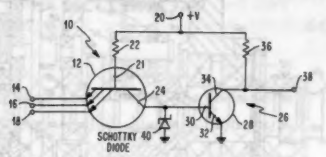
A transistorized sub-nanosecond pulse generator circuit having a pair of emitter coupled transistors in a monostable multivibrator configuration. By selecting an interstage capacitor, a collector load resistor, and a base bias or dividing resistor, in accordance with developed formulas, the operation of the transistorized pulse generator may effectively match the operation of conventional step-recovery-diode pulse generator circuits.

3,699,362

TRANSISTOR LOGIC CIRCUIT

Paul V. Jordan, Beacon, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1971, Ser. No. 147,568
Int. Cl. H03k 19/34
U.S. Cl. 307—300 4 Claims



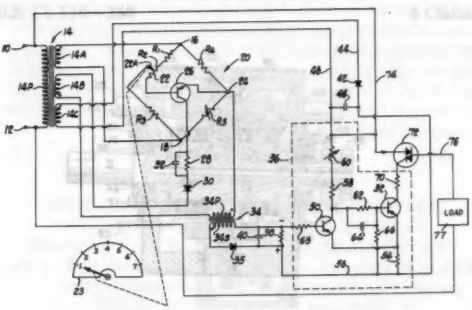
A transistor-transistor logic circuit employing a Schottky barrier diode connected across the output of the multi-emitter input transistor and the reference potential to suppress transient overshoot by controlling the voltage at the collector of the input transistor of the TTL circuit.

3,699,363

PROCESS CONTROL CIRCUITRY

George S. Roberts, Avon, Ohio, assignor to By George, Inc., Avon, Ohio

Filed Sept. 8, 1970, Ser. No. 70,204
Int. Cl. H03k 17/56
U.S. Cl. 307—308 21 Claims



A control circuit utilizes a bridge arrangement responsive to variable resistance in one arm thereof that varies as a harmonic progression to control an external device such as a relay. An opposite arm of the bridge serves as a linear set point control for the external device that controls a process variable.

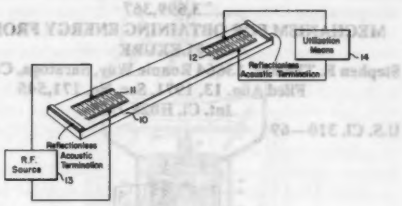
3,699,364

ACOUSTIC SURFACE WAVE DEVICE HAVING IMPROVED TRANSDUCER STRUCTURE

Henry M. Gerard, San Diego, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 4, 1971, Ser. No. 150,108
Int. Cl. H01v 7/00
U.S. Cl. 310—9.8 16 Claims

An improved transducer structure of the interdigitated electrode type is disclosed. In many microwave acoustic devices it is necessary to convert rf energy to acoustic surface wave energy and vice versa. When the acoustic medium is a piezoelectric substrate, interdigitated electrode transducers are widely employed. When such transducers are amplitude weighted, acoustic wave phase distortion of a serious nature can occur. Such phase distortion is eliminated by the use of an interdigitated transducer having dummy (i.e. non-active) electrodes disposed in the transducer pattern so as to present a substantially uniform metalization density to the propagating acoustic surface wave.

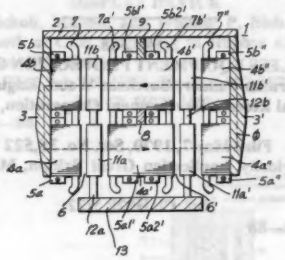


3,699,365

ELECTRODYNAMIC LINEAR MOTOR

Wilhelm Leitgeb, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Aug. 2, 1971, Ser. No. 168,111
Claims priority, application Germany, Aug. 12, 1970, P 20 40 986.3
Int. Cl. H02k 41/02
U.S. Cl. 310—12 5 Claims



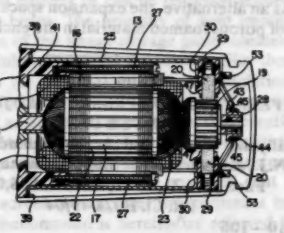
A synchronous electrodynamic motor comprises a primary part with a yoke which has lateral parts. The lamination stacks of the primary part carry a multiphase AC winding and are subdivided in height into portions which are surrounded by respective direct current excitation windings whose magnetic flux path is closed only through the lateral parts of the yoke.

3,699,366

POWER TOOL WITH MOTOR SUPPORT MEANS

John W. Wood, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 7, 1971, Ser. No. 150,852
Int. Cl. H02k 7/14
U.S. Cl. 310—50 8 Claims



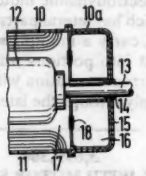
A power tool having a plastic housing containing a unitized motor assembly. The motor assembly includes a cylindrical

sheet metal support which provides permanently stable location of all of the functional motor parts.

3,699,367
MECHANISM FOR OBTAINING ENERGY FROM TIRE FLEXURE
Stephen E. Thomas, 13664 Ronnie Way, Saratoga, Calif.
Filed Aug. 13, 1971, Ser. No. 171,545
Int. Cl. H02k 7/18
U.S. Cl. 310—69 **4 Claims**

Located within a flexible vehicle tire is a device which has one portion corotatable with the wheel and a second portion which is reciprocated in a radial sense by the normal flexure of the tire, as the tire moves into ground engagement, is first depressed and then expands to its original condition after moving out of ground engagement. The relative radial movement which occurs between these two portions is utilized to operate an electromagnetic generator.

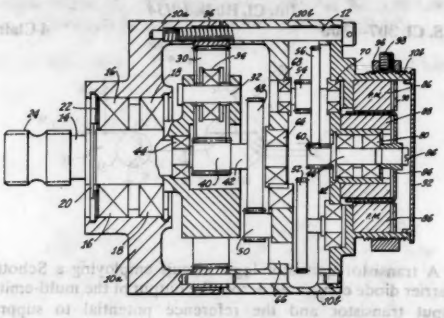
3,699,368
VENTLESS EQUIPMENT PROTECTION CASING
Kenneth Norman Palmer, Boreham Wood, England, assignor to National Reserch Development Corporation, London, England
Filed May 7, 1970, Ser. No. 35,522
Claims priority, application Great Britain, May 14, 1969, 24,633/69
Int. Cl. H02k 5/22
U.S. Cl. 310—88 **10 Claims**



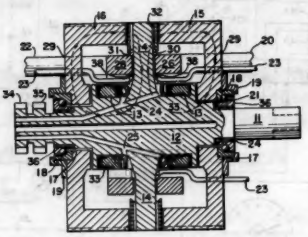
Equipment, particularly of an electrical nature, is protected against internal explosion and flame hazard by enclosing the equipment and separating the equipment space within the enclosure from an expansion space in the enclosure by a flame arrester. As an alternative, the expansion space can be defined by a body of porous foamed material in the enclosure.

3,699,369
TEMPERATURE COMPENSATED ADJUSTABLE DAMPER UNIT
Edward Hlipala, Wayne, and Arnold Schindel, Fair Lawn, both of N.J., assignors to The Singer Company
Filed June 21, 1971, Ser. No. 155,069
Int. Cl. H02k 49/04
U.S. Cl. 310—106 **3 Claims**

An adjustable damper unit is provided which exerts a restraining torque on a shaft, the torque being directly proportional to the angular velocity of the shaft. Damping is provided by a magnetic restraint on a drag cup driven through the magnetic field of a permanent magnet by planetary gears. An external adjusting ring controls the magnitude of the magnetic restraint and thereby controls the damping rate.



3,699,370
HOMOPOLAR GENERATOR
Deane B. Caldwell, 3908 Wythe Avenue, Richmond, Va.
Filed March 3, 1971, Ser. No. 120,617
Int. Cl. H02k 31/04
U.S. Cl. 310—178 **14 Claims**



A homopolar generator having a rotor with a disc shaped portion which rotates in a stator. A magnetic field is induced in the rotor and stator by at least one field winding which may be mounted about the rotor or on the stator or on both. A pair of annular bus bars are situated adjacent to and on opposite sides of the disc shaped portion of the rotor for collecting the generated current passing through the rotor. A liquid metal brush interfaces the disc portion of the rotor and the bus bars for an efficient conduction of current therebetween. The internal resistance of the generator is substantially reduced since the length of the current path through the disc is relatively small compared to the cross-sectional area thereof.

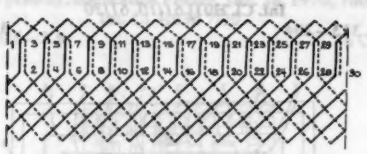
In one embodiment the field windings are mounted about the stator which windings generate a magnetic field that is cut by the rotating disc portion of the rotor thereby generating a current in the rotor which passes from one side to the other side of the disc substantially transverse to the direction of the magnetic flux lines and the rotation of the rotor. In a second embodiment the field windings are mounted about the rotor and therefore a rotating magnetic field is generated which field rotates with the rotor and cuts once each revolution of the rotor, a pair of but bars which extend through the stator thereby generating a current in the bus bars.

3,699,371

SERIES-WAVE WINDINGS FOR DYNAMO-ELECTRIC MACHINES

Jacques Henry-Baudot, Antony, France, assignor to Kollmorgen Corporation, Holyoke, Mass.

Filed April 7, 1971, Ser. No. 131,863
Claims priority, application France, April 8, 1970, 7012672
Int. Cl. H02k 3/00
U.S. Cl. 310—207 6 Claims



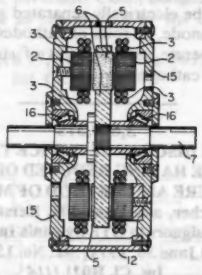
A series-wave winding for a dynamo-electric multipolar machine having at least three pairs of inductor field poles on a face of a magnetic airgap progresses by waves each covering a quadruple polar pitch of the machine.

3,699,372

ROTOR FOR DYNAMO-ELECTRIC MACHINE OF THE AXIAL AIRGAP TYPE

Michio Abe, Kasugai, and Naoyuki Maeda, Inuyama, both of Japan, assignors to Tokai Cold Forming Co., Ltd., Kasugai-shi, Aichi-ken, Japan

Continuation-in-part of Ser. No. 773,738, Nov. 6, 1968. This application June 17, 1971, Ser. No. 154,183
Claims priority, application Japan, June 27, 1968, 43/44182
Int. Cl. H02k 1/00
U.S. Cl. 310—268 6 Claims



A dynamo-electric machine of the axial airgap type has a rotor comprising a plurality of wedge-shaped grain oriented core segments arranged in a circular array, each core segment having a crystallographic orientation such that the directivity of magnetic orientation thereof, in directions parallel to the rotor axis, is high at and around the inner portion of the lamination, proximate to the rotor periphery, and is low at and around the inner portion of the lamination, proximate to the rotor shaft. Preferably, the core segments are made of iron having a degree of purity of at least 99.6 percent.

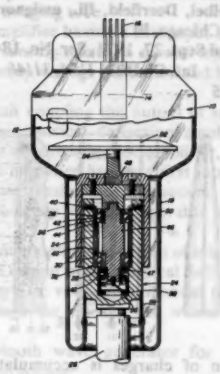
3,699,373

X-RAY TUBE WITH ELECTRICALLY CONDUCTIVE BEARING BYPASS

William P. Holland, West Redding, and Robert E. Azud, Wilton, both of Conn., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed July 2, 1971, Ser. No. 159,235
Int. Cl. H01j 35/10
U.S. Cl. 313—60 17 Claims

An X-ray tube of the rotating anode type having an auxiliary contact structure for providing efficient electrical conductivity in bypass relation to the support bearings, and including means for preventing generated wear particles from passing into the support bearings, thus improving support bearing life and permitting use in support bearings of materials having relatively poor electrical conductivity characteristics.

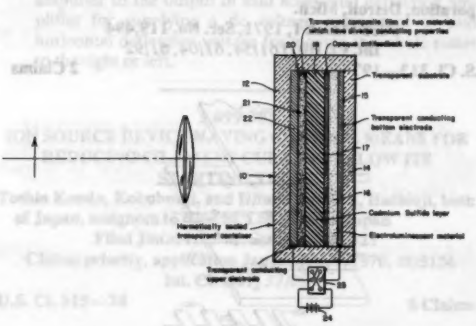


3,699,374

LIGHT ACTIVATED, HIGH RESOLUTION, FIELD SUSTAINED CONDUCTIVITY IMAGE STORAGE AND DISPLAY DEVICE

Ronald F. Scholl, Malibu, and William P. Bleha, Jr., Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 15, 1971, Ser. No. 162,887
Int. Cl. H01j 1/63
U.S. Cl. 313—94 6 Claims



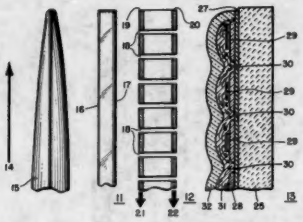
This invention provides a solid state image-storage panel, in the form of a multi-layered thin film structure, which can exhibit and retain a high resolution image momentarily impressed thereupon by light. The image can either be projected on the panel in entirety or can be recorded sequentially by a scanning light beam. The intensity of light impinging on an elemental area of the image-storage panel creates local conductivity modulations within the storage film thereof which correspond to the input image. These modulations, in turn, alter local field configurations across an electroluminescent layer disposed adjacent the storage film, thus creating a visible output image. After initial exposure, the conductivity modulations in the storage film are maintained for an extended period of time (several tens of seconds) provided that an applied electric field across the storage film continues to be maintained. This phenomenon is hereinafter referred to as "field sustained conductivity." Removal or reversal of the applied electrical field restores the storage film to its initial insulating condition, and the image-storage panel is thereby erased.

3,699,375

IMAGE DETECTOR INCLUDING SENSOR MATRIX OF FIELD EFFECT ELEMENTS

Gerhard E. Weibel, Deerfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 27, 1971, Ser. No. 184,134
Int. Cl. H01j 1/54, 31/48
U.S. Cl. 313—95 7 Claims



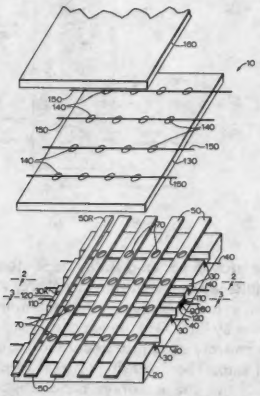
A distribution of charges is accumulated over a leaky dielectric layer in response to electrons from a microchannel plate, which amplifies the output of a photocathode layer stimulated by optical image information. Each respective element of an array of field-effect elements, coextensive with the charged dielectric and adjacent to the surface of the dielectric opposite the microchannel plate, is differently modulated in conductivity by the local field due to the local charge on the portion of the dielectric adjacent the respective element. Readout by periodic scanning of the level of conductivity of each such element results in a modulated output signal suitable for the reproduction of the optical image information in amplified form.

3,699,376

KEEP-ALIVE ELECTRODE FOR DISPLAY PANEL

Bernard Caras, Princeton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed March 1, 1971, Ser. No. 119,494
Int. Cl. H01j 61/54, 61/04, 61/92
U.S. Cl. 313—197 2 Claims



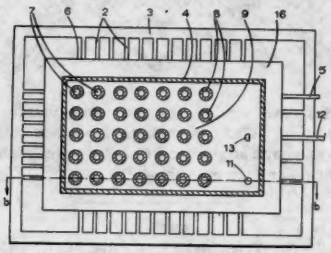
A keep-alive electrode arrangement is intended for use with a display panel which includes a slotted base plate in which a first set of electrodes is seated, with a second set being seated on or in the top surface of the base plate to form an array of first gas-filled cells. An apertured insulating plate is seated on the base plate with the second electrodes therebetween, and third electrodes are seated on the top surface of the second plate. A glass cover plate completes the panel. A keep-alive electrode arrangement comprises first and second electrodes, both seated in one of the slots in the base plate suitably insulated from each other and providing a glow area which is in communication with one of the second electrodes.

3,699,377

GLOW DISCHARGE DISPLAY DEVICE INCLUDING AN INSULATING ENVELOPE BLOCK WITH AN ARRAY OF CAVITIES THEREIN

Raymond Frederick Hall, Crawley, and Douglas Raymond Mainard, Salfords, both of England, assignors to U.S. Philips Corporation

Filed Dec. 28, 1970, Ser. No. 101,548
Claims priority, application Great Britain, Dec. 30, 1969, 63,248/69
Int. Cl. H01j 61/10, 61/30
U.S. Cl. 313—204 3 Claims



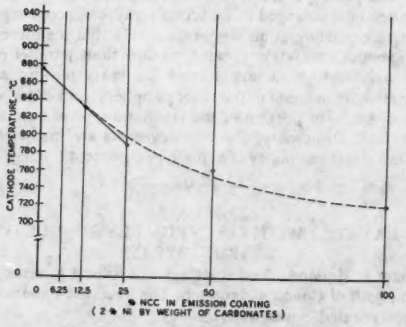
An electrical glow-discharge matrix display tube comprises an array of cavities provided in a face of a block of electrically insulating material. A glow-discharge cathode is provided at the bottom of each cavity and an anode or anodes are provided facing the open end of each cavity so as to define an array of individually addressable glow-discharge paths. The open end of each cavity is completely surrounded by an individual recess so as to reduce the electrical leakage which would otherwise occur between adjacent cavities due to sputtered material being deposited on the face of the block. The cathodes may all be electrically separated and may cooperate with a common anode, or rows of cathodes may be interconnected and cooperate with a series of strip-shaped anodes orthogonal to the cathode rows.

3,699,378

ELECTRON DISCHARGE DEVICE THERMIONIC CATHODE HAVING REDUCED OPERATING TEMPERATURE AND METHOD OF MAKING SAME

William E. Buescher, and Donald R. Kerstetter, both of Emporium, Pa., assignors to GTE Sylvania Incorporated

Filed June 30, 1971, Ser. No. 158,157
Int. Cl. H01j 1/14
U.S. Cl. 313—346 DC 1 Claim



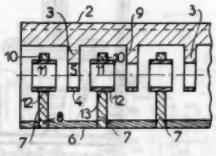
Reduction of thermionic cathode operating temperature is accomplished by the inclusion in the emissive coating of amounts of nickel coated carbonates which can ordinarily vary between more than 0 percent and up to about less than

25 percent by weight of the emissive material without adversely effecting emission. The nickel coated carbonates contain from about 2 percent to about 7 percent by weight nickel.

3,699,379
DELAY LINES

Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 19, 1971, Ser. No. 107,787
Claims priority, application France, Jan. 26, 1970, 7002640
Int. Cl. H03h 7/30
U.S. Cl. 315—3.5 **6 Claims**

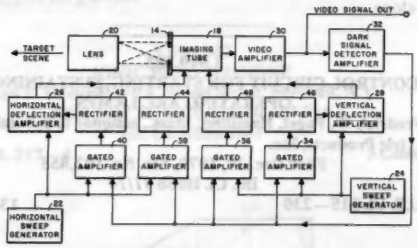


This asymmetrical interdigital delay line is constituted by two combs of triangular interleaved fingers of different dimensions, with the fingers of one comb provided near their extremities with a hole, while those of the other comb are provided near their tips with a tube of a width larger than the thickness of the fingers, the axis of the tube coinciding with the axis of the holes and that of the beam passing through the delay line in operation, this structure bringing the advantages of direct fundamental mode operation and good heat dissipation.

3,699,380
AUTOMATIC BORESIGHTING CIRCUIT

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 17, 1964, Ser. No. 361,613
Int. Cl. H01j 29/70
U.S. Cl. 315—21 R **2 Claims**



1. In an automatic boresighting circuit for use in an electro-optical guidance system, the combination comprising:

a. a television type imaging tube for scanning a target to be tracked,

b. means on the face of said imaging tube defining a rectangular area which is smaller than the area of the face of said tube,

c. sweep circuit means for scanning said rectangular area of said imaging tube,

d. sensing means affixed to the face of said imaging tube for sensing when the scanning action scans on the area outside said rectangular area,

e. control circuit means coupled to said sensing means and to said sweep circuit means for maintaining said scanning within said rectangular area, said control circuit including:

f. a first sawtooth wave generator for generating a vertical sweep voltage,

g. a vertical deflection amplifier coupled to said first sawtooth wave generator and to said imaging tube for controlling the amplitude of the vertical deflection voltage applied to said imaging tube.

h. a first gated amplifier having a first input coupled to the output of said sensing means, a second input coupled to said vertical sweep voltage generator and having an output,

i. a rectifier circuit coupling the output of said first gated amplifier to said vertical deflection amplifier for controlling the gain of said deflection amplifier,

j. a second gated amplifier having a first input coupled to the output of said sensing means, a second input coupled to said vertical sweep voltage generator and having an output,

k. a rectifier circuit coupling the output of said second gated amplifier to the output of said vertical deflection amplifier for supplying a dc voltage component to said vertical deflection voltage for moving the whole raster up or down,

l. a second sawtooth wave generator for generating a horizontal sweep voltage,

m. a horizontal deflection amplifier coupled to said second sawtooth wave generator and to said imaging tube for controlling the amplitude of the horizontal deflection voltage applied to said imaging tube,

n. a third gated amplifier having a first input coupled to the output of said sensing means, a second input coupled to said second sawtooth wave generator and having an output,

o. a rectifier circuit coupling the output of said third gated amplifier to said horizontal deflection amplifier for controlling the gain of said deflection amplifier,

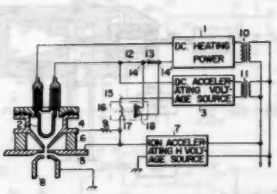
p. a fourth gated amplifier having a first input coupled to the output of said sensing means, a second input coupled to said horizontal sweep voltage generator and having an output,

q. a rectifier circuit coupling the output of said fourth gated amplifier to the output of said horizontal deflection amplifier for supplying a dc voltage component to said horizontal deflection voltage for moving the whole raster to the right or left.

3,699,381
ION SOURCE DEVICE HAVING CONTROL MEANS FOR REDUCING FILAMENT CURRENT BELOW ITS STARTING VALUE

Toshio Kondo, Kokubunji, and Hifumi Tamura, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1971, Ser. No. 105,321
Claims priority, application Japan, Jan. 9, 1970, 45/5124
Int. Cl. H01j 33/00
U.S. Cl. 315—74 **6 Claims**



An ion source device of the Duoplasmatron type has a current reduction resistor in the filament circuit thereof for reducing the filament current during steady state operation thereof, and a relay adapted to normally short-circuit both terminals of the current reduction resistor, which relay is energized by a current flowing through an intermediate electrode

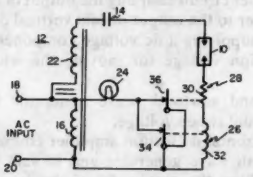
circuit so as to open both of these terminals of the resistor thereby making it possible to reduce the steady state filament current.

3,699,382

AUXILIARY LIGHTING SYSTEM FOR ARC LAMP

Anton Franke, Danvers, Mass., assignor to Sylvania Electric Products Inc.

Filed Feb. 4, 1971, Ser. No. 112,684
Int. Cl. H05b *41/46, 39/10*
U.S. Cl. 315—92 **5 Claims**



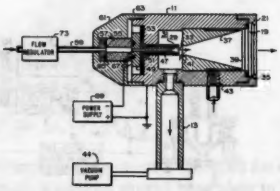
An auxiliary lighting system for a high pressure arc discharge lamp operated by a ballast having AC input terminals and output terminals for connecting the arc lamp in an operating circuit loop. A current sensing electromagnetic relay controls a standby incandescent lamp to provide illumination during the arc lamp cooling off period following a power interruption. The relay coil is series connected in the arc lamp circuit loop, and the relay contacts are serially connected with the incandescent lamp across the AC input of the ballast. A preferred embodiment further includes a current sensitive thermal relay for controlling the standby incandescent lamp to maintain a light output during the warm up period following restriking of the arc lamp.

3,699,383

FLOW-THROUGH HOLLOW CATHODE SPECTRAL LIGHT SOURCE AND METHOD OF OPERATING SAME

Robert L. Chaney, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 28, 1970, Ser. No. 101,872
Int. Cl. H01j *61/06, 61/28*
U.S. Cl. 315—111 **12 Claims**



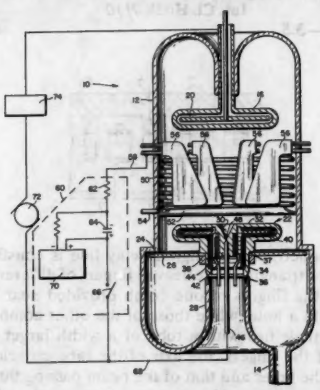
An atomic spectral lamp includes a demountable, hollow cathode, and a funnel-shaped anode adjacent to the cathode. A glow discharge plasma is established in the cathode cavity. Counterflow through the funnel-shaped anode prevents self absorption of light by atomic vapor. Gas flow through the hollow cathode at a predetermined velocity increases the intensity of light-emitted from the plasma.

3,699,384

OFFSWITCHING OF LIQUID METAL ARC SWITCHING DEVICE BY INTERNAL CURRENT DIVERSION TO AN AUXILIARY ELECTRODE

Wilfried O. Eckhardt, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 7, 1971, Ser. No. 178,238
Int. Cl. H01j *7/24, 13/06*
U.S. Cl. 315—111 **16 Claims**



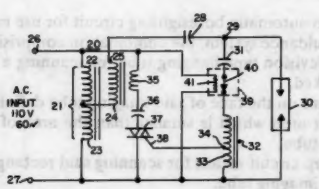
An enclosed vessel containing one or more anodes, a main cathode, one or more auxiliary cathodes, and means for maintaining a low pressure in the tube comprises a liquid-metal arc switching device. The main cathode is fed with a metal which is liquid at convenient temperatures, so that limited quantities of the metal are present and available on the cathode for arcing. The interior of the vessel is maintained at a low background pressure so that, during nonconduction, vacuum space insulation is provided between the anodes and the cathodes. Arc initiation is accomplished by any convenient initiator, and the arc runs upon the small amount of liquid metal fed at an appropriate rate to the main cathode. For arc extinction, at least one auxiliary cathode is positioned within the envelope.

3,699,385

CONTROL CIRCUIT FOR STARTING, SUSTAINING AND OPERATING ARC LAMPS

Fredrick W. Paget, Hamilton, Mass., assignor to Sylvania Electric Products, Inc.

Filed Dec. 30, 1970, Ser. No. 102,855
Int. Cl. H05b *41/14*
U.S. Cl. 315—239 **13 Claims**



A control circuit for starting, sustaining and operating metal halide arc lamps comprising a bridged air gap ballast transformer having AC input terminals and output terminals for connection to an arc lamp. A differentiating circuit is connected across the output terminals for detecting voltage transitions in the lamp circuit and generating trigger signals in response thereto. Serially connected across the AC input terminals are a pulse winding magnetically coupled to the secon-

dary winding of the ballast transformer, a capacitor, and a switch for discharging the capacitor through the pulse winding in response to the trigger signal from the differentiating circuit to thereby supply a voltage pulse of sufficient energy to ignite the arc lamp.

3,699,386

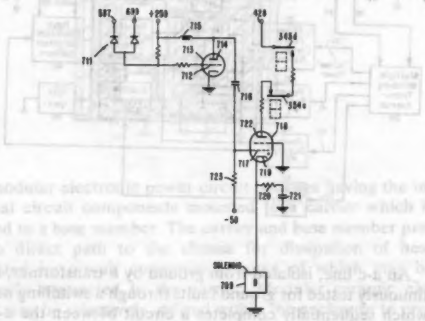
FIRING CIRCUIT FOR GAS DISCHARGE TUBES

John J. Lentz, 27 Hywood Place, Chappaqua, N.Y.

Division of Ser. No. 388,160, Oct. 26, 1953, Pat. No. 3,517,391. This application Feb. 11, 1970, Ser. No. 14,891

Int. Cl. H01h *47/30;* **H01j** *17/36;* **H03b** *11/08*

U.S. Cl. 315—356 **5 Claims**



This specification describes a circuit for triggering a gas tube in response to a pulse whose magnitude may be small and whose length is indeterminate and may be short with respect to the time necessary to cause the conduction of the gas tube. The pulse is applied to the grid of a triode to cause it to conduct. The plate circuit of the triode contains an inductor which stores energy upon the application of the pulse. When the pulse ends and the triode turns off oscillations begin in a ringing circuit comprising the inductor and stray plate to ground capacitance. The energy then oscillating between the inductor and the capacitance produces a high energy pulse that triggers the gas tube.

3,699,387

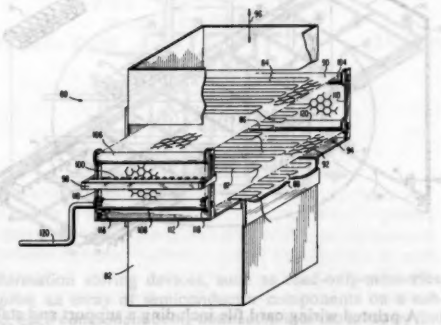
IONIC WIND MACHINE

Harrison F. Edwards, 79 S. Broad Street, Norwich, N.Y.

Filed June 25, 1970, Ser. No. 49,714

Int. Cl. H05h *5/06*

U.S. Cl. 317—4 **3 Claims**



Disclosed is a wind generating machine with no moving parts. A thin corona wire is located adjacent a wire mesh and a potential gradient of from 7,000 to 20,000 volts causes air to flow in a direction from the wire toward the mesh. The air flow is voltage sensitive. Several stages may be provided and the mesh may form part of a continuous belt. A rigid self-contained assembly is provided by physically connecting the wire and mesh.

3,699,388

APPARATUS FOR ELECTROSTATIC CHARGING OF PAPER IN ELECTROPHOTOGRAPHIC REPRODUCTION

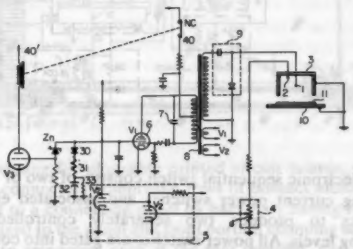
Takeshi Ukai, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 736,054, June 11, 1968. This application May 17, 1971, Ser. No. 144,182

Claims priority, application Japan, July 6, 1967, 42/43571

Int. Cl. G03g *15/02;* **H01t** *19/00*

U.S. Cl. 317—4 **5 Claims**



A corona discharge electrode is supplied with voltage from a high frequency power source to produce a corona discharge which strikes a sheet of reproducing paper to charge the same electrostatically. A detection electrode is positioned in the field of the corona discharge and is connected via a resistor and amplifier to the power source to control the same in accordance with the detected corona discharge to maintain the magnitude of the discharge field constant. A switch is connected in the power supply to interrupt connection thereof with the discharge electrode if a spark discharge is produced between the discharge electrode and the paper.

3,699,389

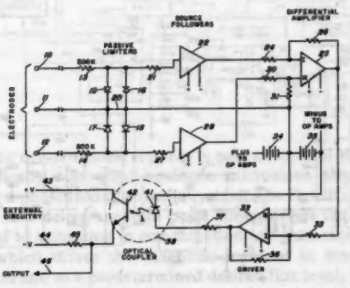
PATIENT ELECTRODE ISOLATION

William Perry Holsinger, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

Filed Nov. 19, 1970, Ser. No. 90,969

Int. Cl. G08c *19/02*

U.S. Cl. 317—9 R **1 Claim**

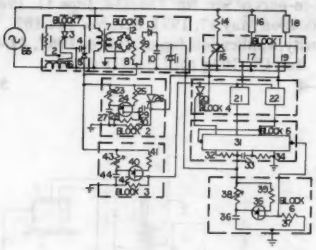


A system for preventing the inadvertent electrocution of a surgical patient through accidental coupling of probes and common equipment to ground. Isolation of the patient from ground is obtained through the use of a light emitting diode and a photo transistor in the probe circuit.

3,699,390
ELECTRONIC SEQUENTIAL SWITCH

Kenneth L. Blakeslee, 330 Glencourtney Drive, N.W., Atlanta, Ga.

Filed Sept. 23, 1971, Ser. No. 183,098
Int. Cl. H02h 3/08
U.S. Cl. 317—16 7 Claims

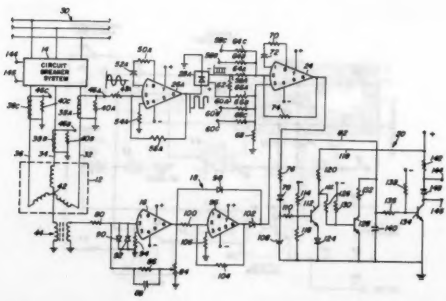


An electronic sequential switch consists of two or more alternating current power switches and associated electronic networks to produce two separately controlled power switching levels. All power switches are gated into conduction simultaneously late in each current half cycle resulting in a low average current flow in the load. Only one of the many power switches receives a conduction signal early in the half cycle and its load receives a high average current. The high average current mode is switched through the many power switches one at a time and is automatically recycled to the first power switch when the final power switch is turned off. The combined circuits provide a means for maintaining a minimum power to all loads at all times and switching a high power to a single load sequentially. Both power levels and sequence rate are adjustable.

3,699,391
REACTOR FAULT RELAY

Larry E. Eilts, Golden, Colo., assignor to The United States of America as represented by the Secretary of the Interior

Filed Sept. 2, 1971, Ser. No. 177,232
Int. Cl. H02h 3/16
U.S. Cl. 317—18 D 5 Claims

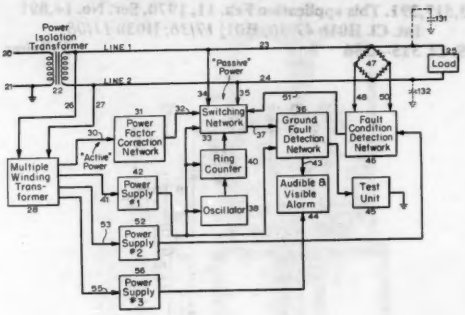


A relay for protecting three-phase, wye-connected circuits by monitoring neutral voltage. To prevent relay operation during normal unbalanced conditions, the current input to each phase is monitored, and relay operation enabled only when three currents are present.

3,699,392
GROUND FAULT DETECTION SYSTEM WITH SEQUENTIAL LINE TESTING

Joo C. Lee, 2311 Spring Hill Lane, Lindenhurst, Ill., and Charles S. Tak, 9128 Kennedy Drive, Des Plaines, Ill.

Filed Nov. 22, 1971, Ser. No. 200,708
Int. Cl. H02h 3/28
U.S. Cl. 317—18 R 15 Claims

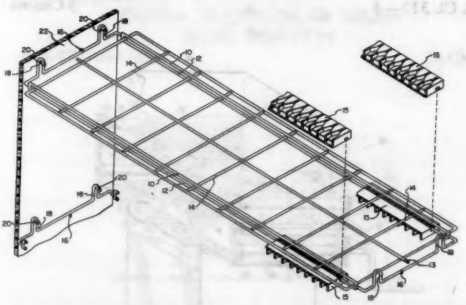


An a-c line, isolated from ground by a transformer, is continuously tested for ground faults through a switching network which sequentially completes a circuit between the a-c conductors, an apparent active power source, and a ground fault detection network. A fault condition detection network is coupled through a bridge circuit to the a-c lines, to provide an indication of a simple fault on either line, or a substantially unbalanced fault on both lines. An oscillator and ring counter arrangement continuously drives a switching network to test for individual line grounds, and balanced and unbalanced double line faults. A self-contained power supply arrangement is provided.

3,699,393
PRINTED WIRING CARD FILE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Aug. 2, 1971, Ser. No. 168,236
Int. Cl. H05k 7/18
U.S. Cl. 317—99 8 Claims

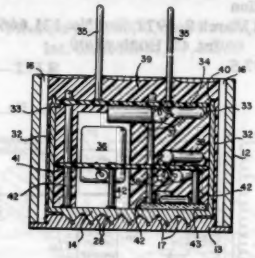


A printed wiring card file including a support and stabilization structure to which notched card guide sections may be clamped. The card guides provide vertical alignment of the printed wiring cards and the support and stabilization structure may be arranged such as to accommodate wiring cards of any desired height.

3,699,394
MODULAR CIRCUIT PACKAGE WITH ENHANCED HEAT DISSIPATION

Chester L. Schuler, Wayland, Mass., assignor to Powercube Corporation, Waltham, Mass.

Filed Nov. 1, 1971, Ser. No. 194,728
Int. Cl. H05k 7/20
U.S. Cl. 317—100 20 Claims

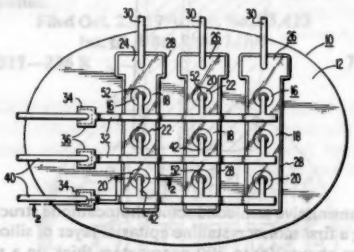


A modular electronic power circuit package having the individual circuit components mounted to a carrier which is secured to a base member. The carrier and base member provide a direct path to the chassis for dissipation of heat generated by circuit components, some of which may be physically connected to the carrier. Modular ceramic elements may be selectively utilized within the enclosure to provide physical and thermal connection and electrical insulation between the carrier and selective circuitry components. A preferred embodiment includes a housing within which one or more modular circuits and carriers may be mounted. The housing provides for various external physical mountings, and several housings (with sub-circuits) may be interconnected and mechanically secured together to form more complex power circuit combinations. The complete enclosure effectively shields against radio frequency interference while enhancing heat dissipation.

3,699,395
SEMICONDUCTOR DEVICES INCLUDING FUSIBLE ELEMENTS

Edward Joseph Boleky, Cranbury, N.J., assignor to RCA Corporation

Filed Jan. 2, 1970, Ser. No. 13
Int. Cl. H01l 19/00
U.S. Cl. 317—101 7 Claims

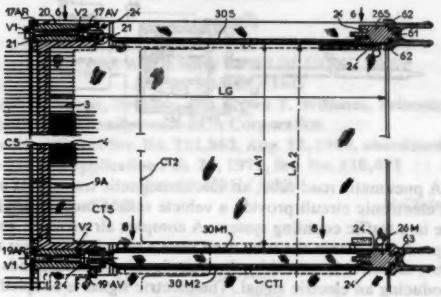


Information storing devices, such as read-only-memories, comprise an array of semiconductor components on a substrate, each component being connected into the array by first and second conductors, the first conductor being of a material well suited as an electrical conductor. e.g., aluminum, and the other well suited as a fuse, e.g., a highly doped semiconductor material. Preferably, the second conductor is disposed on a thermal insulating layer.

3,699,396
MOUNTING SYSTEM FOR PRINTED CIRCUIT BOARDS

Gerard Colaud, Epinay, Seine, and Bernard Fanene, Garges Les Gonesse, both of France, assignors to Societe Industrielle Honeywell Bull (Societe anonyme), Paris, France

Filed April 21, 1971, Ser. No. 136,080
Int. Cl. H02b 1/02
U.S. Cl. 317—101 DH 8 Claims

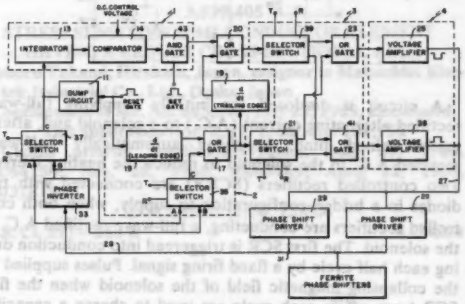


A mounting for pluggable printed circuit boards, wherein parallel connectors comprising rows of contact elements are attached to a connection panel by back bars having rear portions affixed to the panel and front portion clamping such connectors to respective ones of the rear portions, and wherein guiding grids provide for inserting printed circuit boards into the connectors and maintaining a mutual parallel relationship between boards so inserted.

3,699,397
FLUX-DRIVER CIRCUIT FOR PHASED ARRAY

John H. Kuck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 30, 1971, Ser. No. 129,412
Int. Cl. H01h 47/22
U.S. Cl. 317—123 15 Claims



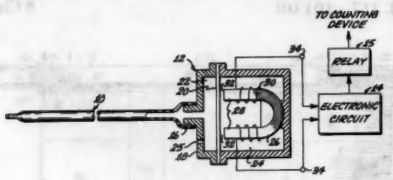
A flux driver circuit supplies a pair of control pulses to a magnetically controlled analogue microwave phase shifter used in a phased array antenna system. The flux driver circuit system first delivers a reset pulse which drives the magnetic material to saturation in one direction and then supplies a set pulse which drives the magnetic material in the opposite direction and to a predetermined desired flux level. When the radar system changes from the transmit to the receive mode and a new predetermined flux level is desired in the phase shifters, the reset-set cycle is again repeated. The level of magnetic flux in the phase shifter is controlled by a D.C. command voltage supplied to the circuit. Provision is made for reversing the polarity of the applied reset-set voltage when switching the antenna between the transmit and the receive modes.

3,699,398

SENSOR FOR VEHICULAR TRAFFIC COUNTERS

Reed A. Newmeyer, 4521 West Claremont, Glendale, Ariz.

Filed Oct. 12, 1971, Ser. No. 188,113
Int. Cl. G08b 13/10; G08g 1/02
U.S. Cl. 317—148.5 R 7 Claims



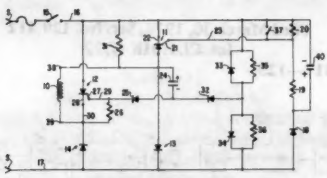
A pneumatic road tube, an electromagnetic transducer and an electronic circuit provide a vehicle sensor mechanism for use in a traffic counting system. A complex air pressure wave is produced within the tube each time a vehicle runs over the tube, the wave is sensed by the transducer which responds by producing an electric signal. The electric signal is coupled to the circuit which blanks out unwanted portions of the signal and shapes the remainder into a signal suitable for application to a counting device.

3,699,399

CIRCUITS FOR CONTROLLING SOLENOID ENERGIZATION TO REDUCE HEATING

Warren A. Barber, Martinsville, N.J., assignor to The Singer Company, New York, N.Y.

Filed Sept. 30, 1968, Ser. No. 763,501
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 B 14 Claims



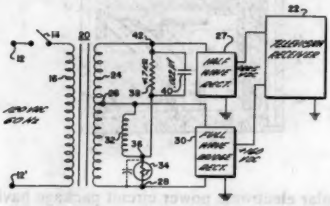
A circuit is disclosed for initially supplying full-wave rectified alternating current (A.C.) to a solenoid and, after a predetermined time, supplying automatically half-wave rectified A.C. to the solenoid to reduce the heating thereof. Two controlled rectifiers (SCR's) are connected with two diodes in a bridge configuration to supply, when both controlled rectifiers are conducting, a full-wave rectified A.C. to the solenoid. The first SCR is triggereed into conduction during each half cycle by a fixed firing signal. Pulses supplied by the collapsing magnetic field of the solenoid when the first SCR turns off in each cycle are used to charge a capacitor through a resistance connected across the gate and cathode of the second SCR thereby initially triggering the second SCR alternately with the first SCR into conduction in each cycle. However, as the capacitor charge builds up incrementally to maximum, the successive current pulses become smaller until they are insufficient to continue the triggering of the second SCR, which then turns off leaving only the first SCR conducting to supply half-wave rectified A.C. to the solenoid which is sufficient to hold its armature in but insufficient to cause abnormal heating. A diode gate controls the discharge path for the capacitor. This diode is reverse-biased by a circuit which clamps its anode to the most negative excursions of the applied A.C. voltage and prevents discharge of the capacitor until the A.C. voltage is removed, whereupon the capacitor is discharged and is thus reset for the next charging operation initiated when the A.C. is again restored. The first SCR may be replaced by a diode if low-level shut-off of the system is not desired.

3,699,400

AUTOMATIC DEGAUSSING APPARATUS FOR MINIMIZING RESIDUAL CURRENT DURING STEADY STATE OPERATION

James Courtland Marsh, Jr., Indianapolis, Ind., assignor to RCA Corporation

Filed March 8, 1971, Ser. No. 121,666
Int. Cl. H01h 47/00
U.S. Cl. 317—157.5 11 Claims



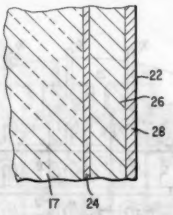
A degaussing coil structure is connected in series with a temperature dependent resistor and coupled to a source of alternating potential. A frequency dependent impedance is connected in series with the temperature dependent resistor and coupled to another source of alternating potential. When the temperature dependent resistor exhibits its steady state operating resistance, a voltage is developed at the junction of the temperature dependent resistor and degaussing coil structure which reduces the voltage gradient across the coil structure to reduce the residual current flowing through the structure.

3,699,401

PHOTOEMISSIVE ELECTRON TUBE COMPRISING A THIN FILM TRANSMISSIVE SEMICONDUCTOR PHOTOCATHODE STRUCTURE

James Joseph Tietjfn, Bell Mead; Brown F. Williams, Princeton, and Chin Chun Wang, Hightstown, all of N.J., assignors to RCA Corporation

Filed May 11, 1971, Ser. No. 143,862
Int. Cl. H011 15/00
U.S. Cl. 317—234 R 16 Claims



A transmissive semiconductor photocathode structure comprising a first monocrystalline epitaxial layer of silicon or germanium about 200 to 300 nanometers thick on a major surface of a transparent monocrystalline dielectric substrate. On the silicon or germanium layer is a second monocrystalline epitaxial layer of a III–V or II–VI semiconductor compound having a thickness of at least about three microns. On the second layer is a third monocrystalline epitaxial layer of a III–V semiconductor compound having an energy bandgap smaller than the second layer compound and having a thickness on the order of from about one micron to about five microns.

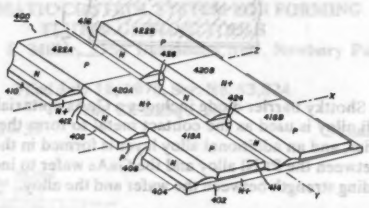
Also disclosed is a photoemissive electron tube utilizing the transmissive photocathode structure, with a work function reducing material deposited on the emissive surface of the third layer.

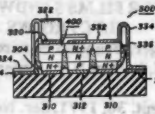
3,699,402

HYBRID CIRCUIT POWER MODULE

Joseph A. McCann, Auburn, and John D. Harnden, Jr., Schenectady, both of N.Y., assignors to General Electric Company

Filed July 27, 1970, Ser. No. 58,273
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **18 Claims**





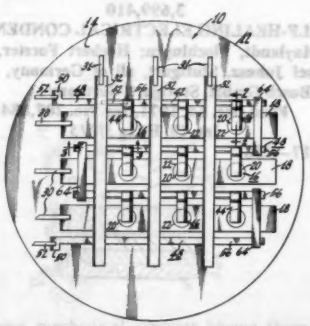
A hybrid circuit is formed on an electrically insulative, thermally conductive substrate surface with an alternating current inverter bridge having associated therewith a switching serving diode. In one form the bridge and the switch serving diode are integrated within a single semiconductive element while in another form the switch serving diode may be integrated into a thyristor semiconductive element so that the thyristor has no reverse current blocking capability.

3,699,403

FUSIBLE SEMICONDUCTOR DEVICE INCLUDING MEANS FOR REDUCING THE REQUIRED FUSING CURRENT

Edward Joseph Boleky, III, Cranbury, N.J., assignor to RCA Corporation

Filed Oct. 23, 1970, Ser. No. 83,423
Int. Cl. H01l *5/00, 11/00*
U.S. Cl. 317—235 R **7 Claims**



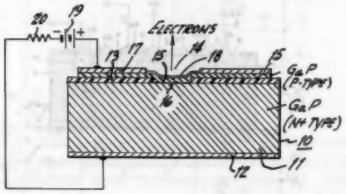
Information storing devices, such as read-only-memories, comprise an array of semiconductor components on a substrate, each component being connected into the array by a fuse. A continuous electrically resistive element is disposed on the substrate, the fuses being disposed on the element. To open-circuit selected ones of the fuses, a current is passed through the element to heat all the fuses to a temperature approaching but less than the melting point of the fuses, and a current is passed through only the selected fuses to further heat them to the fusing temperature thereof.

3,699,404

NEGATIVE EFFECTIVE ELECTRON AFFINITY EMITTERS WITH DRIFT FIELDS USING DEEP ACCEPTOR DOPING

Ralph E. Simon, Trenton, and Brown F. Williams, Princeton, both of N.J., assignors to RCA Corporation

Continuation of Ser. No. 751,862, Aug. 12, 1968, abandoned. This application Feb. 24, 1971, Ser. No. 118,491
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R **6 Claims**



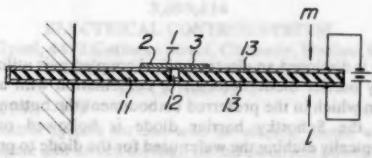
An electron emitter comprising a body of gallium phosphide having a thin surface layer of cesium. The gallium phosphide is doped with a deep acceptor such as iron. Interaction between the cesium layers and the semiconductor surface results in ionization of the deep acceptor impurities in a small region near the surface. The ionization of deep acceptors at the cesiated surface results in a graded concentration of ionized impurities through the gallium phosphide layer, which establishes an internal electric field for impelling electrons toward the cesiated emitting surface.

3,699,405

STRESS SENSITIVE SEMI-CONDUCTOR ELEMENT HAVING A REDUCE CROSS-SECTIONAL AREA

Noboru Yukami, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 843,593, July 22, 1969, abandoned. This application Nov. 2, 1971, Ser. No. 194,996
Claims priority, application Japan, July 29, 1968, 43/54150; Nov. 20, 1968, 43/85749; April 12, 1969, 44/31819
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **4 Claims**



A stress sensitive semiconductor element comprising first and second low-resistivity regions of different conductivity types formed in a common semiconductor substrate, a third region of a high resistivity the conductivity type of which is the same as that of said second region, said third region being formed in said common semiconductor substrate in contact with said first and second regions, the junction between said first region and said third region being made deeper and that

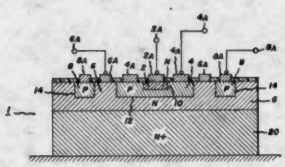
between said second region and said third region being made shallower, wherein a constricted potion is provided at the center of which substantially corresponds to the junction between said first region and said second region, and the distance from the junction between the third region and the first region to that between the third region and the second region is made substantially equal to or longer than the effective diffusion length of a carrier.

3,699,406

SEMICONDUCTOR GATE-CONTROLLED PNPN SWITCH

Thomas C. Mapother, Liverpool, and Richard L. Wilson, Baldwinsville, both of N.Y., assignors to General Electric Company

Filed Dec. 26, 1963, Ser. No. 333,478
Int. Cl. H01l 9/12, 11/10
U.S. Cl. 317—235 R 11 Claims



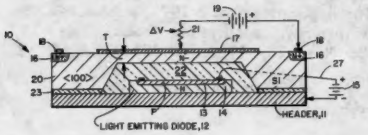
A PNPN controlled switch is provided wherein all four active regions and the three junctions therebetween terminate at a common major face of a semiconductor body. Adjacent the carrier path between emitter and collector there is provided a region of hither concentration to trap some of the carriers leaving the emitter.

3,699,407

ELECTRO-OPTICAL COUPLED-PAIR USING A SCHOTTKY BARRIER DIODE DETECTOR

Richard W. Gurtler, Mesa, and Jack L. Saltich, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 29, 1971, Ser. No. 184,819
Int. Cl. H01l 15/00
U.S. Cl. 317—235 R 9 Claims



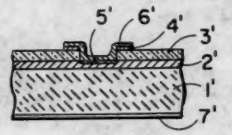
There is disclosed an electro-optical coupled pair utilizing a Schottky barrier diode detector in combination with a light source in which in the preferred embodiment the bottom portion of the Schottky barrier diode is hollowed out by anisotropically etching the wafer used for the diode to provide the hollowed-out portion with smooth inclined sidewalls over the light source for coupling light generated laterally into the wafer. Because of the anisotropic etching, the sidewalls serve to couple a much greater percentage of the generated light into the diode to produce more electron-hole pairs, and therefore more external signal. This configuration thus captures non-vertically generated light which would otherwise be lost, thus increasing the efficiency of Schottky diode detectors and the coupled pair.

3,699,408

GALLIUM-ARSENIDE SCHOTTKY BARRIER TYPE SEMICONDUCTOR DEVICE

Daizaburo Shinoda, and Masaoki Ishikawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 20, 1971, Ser. No. 108,125
Claims priority, application Japan, Jan. 23, 1970, 45/6658; Jan. 23, 1970, 45/6659
Int. Cl. H01l 3/20
U.S. Cl. 317—237 3 Claims



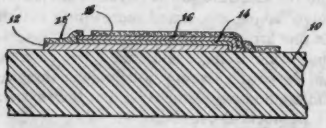
A Shottky barrier diode includes a GaAs epitaxial wafer. A Pt-Ni alloy is used as the contact metal to form the Schottky barrier, and an additional alloy layer is formed in the boundary between the Pt-Nl alloy and the GaAs wafer to increase the bonding strength between the wafer and the alloy.

3,699,409

SOLID STATE DEVICE HAVING DIELECTRIC AND SEMICONDUCTOR FILMS SANDWICHED BETWEEN ELECTRODES

Alfred E. Feuersanger, Franklin Square, and Moe S. Wassermann, Glen Head, both of N.Y., assignors to GTE Laboratories Incorporated

Filed Sept. 30, 1971, Ser. No. 185,290
Int. Cl. H01l 3/00
U.S. Cl. 317—238 5 Claims



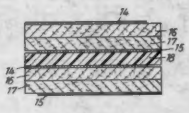
A thin film capacitor utilizes a metal base electrode formed on a substrate with an aluminum oxide film formed on the base electrode. A film of semiconducting material, preferably nickel oxide is formed on the aluminum oxide film and a metal layer formed on the semiconducting layer provides a top electrode for the capacitor. The capacitor may be formed as part of the monolithic integrated circuit or used as part of a hybrid integrated circuit.

3,699,410

SELF-HEALING ELECTRICAL CONDENSER

Helmut Maylandt, Plochingen; Herbert Forster, Grunbach, and Josef Juhasz, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 14, 1971, Ser. No. 207,884
Int. Cl. H01g 3/215
U.S. Cl. 317—258 8 Claims



A first and at least two second electrodes are provided, with the latter flanking the former. First dielectric separating

means is provided between the first electrodes and one of the second electrodes and has *n* paper strips and *m* synthetic plastic strips with *n* being a whole number excluding zero and one, and *m* being a whole number including zero and one, and with n being greater than *m*. Second dielectric separating means is provided between the first electrode and the other of the second electrodes and comprises N plastic strips and M paper strips with N being a whole number including one, M being a whole number including zero and N being greater than M. The electrodes are each applied to one side of two paper strips and the latter have uncovered sides facing one another, with the first and second dielectric separating means being electrically connected in parallel with each other.

3,699,411

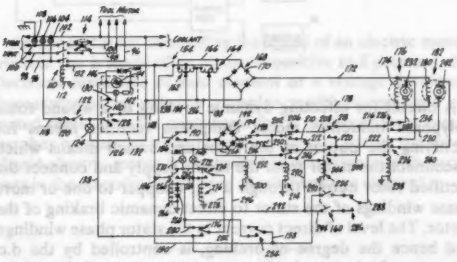
AUTOMATIC CONTROL SYSTEM FOR FORMING FLUTED CUTTING TOOLS

Warner G. S. Miller, 3756 Danmont Circle, Newbury Park, Calif.

Filed July 10, 1970, Ser. No. 53,824

Int. Cl. B23q *5/28*

U.S. Cl. 318—39 **3 Claims**



In combination with a machine for manufacturing fluted cutting tools, an automatic electronic control system which includes separate circuits for forward and reverse directions of cutting tool movement wherein a single pulse relay controls selection of either the forward or reverse direction.

3,699,412

TIMEBASE VIBRATOR ASSEMBLY

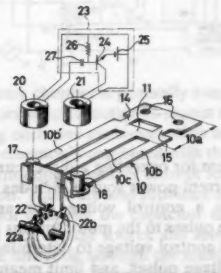
Toshikazu Hatsuse; Hiromi Ueda; Shoulti Ozawa, and Yuh Yasuda, all of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed March 26, 1971, Ser. No. 128,298

Claims priority, application Japan, March 28, 1970, 45/29846; March 31, 1970, 45/30795; Dec. 25, 1970, 45/125315

Int. Cl. H02k *7/06*

U.S. Cl. 318—128 **2 Claims**



In a timebase mechanical vibrator having three parallel oscillating arms arranged in a common plane wherein the central arm oscillates in opposite phase to the two outer arms, the width of the central arm is $2a/n$ when the width of each outer arm is a and n is a positive integer greater than unity. A sensing magnet is mounted on the free end of one of the outer arms and a driving magnet is mounted on the free end of the other outer arm. A feed magnet is mounted on the free end of the central arm in magnetic cooperation with a rotatable gear wheel to intermittently advance the gear wheel.

3,699,413

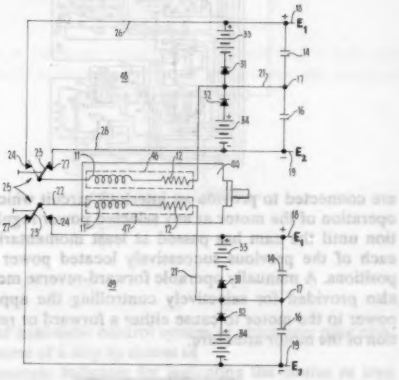
POWER DRIVE CIRCUIT FOR INDUCTIVE LOADS

Claudio de Sa e Silva, and Daniel R. Cheever, both of Bozeman, Mont., assignors to Summit Engineering Corporation, Bozeman, Mont.

Filed Nov. 9, 1970, Ser. No. 88,026

Int. Cl. H02k *37/00*

U.S. Cl. 318—138 **1 Claim**



A power drive circuit is described for rapidly energizing a load having a high inductance with a potential greater than that for which the load is rated, while yet protecting the load from the high current normally associated with such a high potential. The preferred circuit includes a pair of capacitors connected in series between the output terminals of the load and switching means to switch the load from across one of the capacitors to across the other to successively discharge each of the capacitors through the load while simultaneously charging the capacitor not being discharged. A diode is placed in shunt with each of the capacitors to clamp the voltage across the capacitor to a predetermined level reached by it as it discharges. In several of the described embodiments, a second source of potential is provided for maintaining current flow through the load after it has been initially energized by the capacitance discharge. The invention is further described in combination with a stepping motor with which it has found particular utility.

3,699,414

ELECTRICAL CONTROL SYSTEM

Louis Gyori, 4472 Gatineau Street, Chomedy, Quebec, Canada

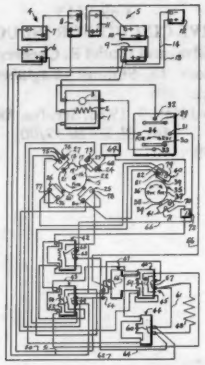
Filed Oct. 15, 1971, Ser. No. 189,688

Int. Cl. H02r *7/14*

U.S. Cl. 318—139 **16 Claims**

A control system for use with an electric motor which is energizable and driven through stored electrical power including first and second power sources. The control system comprises a rotatable cam which is manually operable through the action of an operator and is capable of actuating any of a plurality of successively located microswitch means in combination, and these microswitch means are connected to a plurality of solenoid actuable members containing suitable switching elements for enabling various modes of electrical power connection to the electric motor. The cam is capable of being rotated through a plurality of successive power regulating

positions by manual actuation of a motor throttle mechanism. The microswitch means located at these power regulating positions control the various solenoid actuable members in such manner as to enable operative connection of the electric motor to the two power sources to provide the proper power to the motor for achieving the desired operating speed at the selected power regulating position. The switching elements



are connected to provide an interlock circuit which prevents operation of the motor at any selected power regulating position until the cam has passed at least momentarily through each of the previous successively located power regulating positions. A manually operable forward-reverse mechanism is also provided for selectively controlling the application of power to the motor to cause either a forward or reverse rotation of the motor armature.

3,699,415

CONSTANT SPEED DRIVE UNITS FOR DRIVING DEVICES

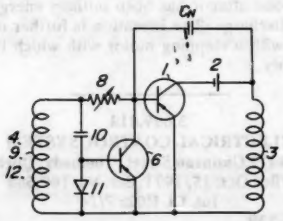
Yutaka Inoue; Tadao Hotta, and Toshihiko Ito, all of Nagoya, Japan, assignors to Aichi Clock and Electric Implement Mfg., Co., Ltd., Nagoya-shi, Japan

Filed Aug. 26, 1970, Ser. No. 67,019

Claims priority, application Japan, Sept. 10, 1969, 44/71788

Int. Cl. G05b *11/02*

U.S. Cl. 318—128 **10 Claims**



The present invention relates a constant speed device for driving means using a transistor switching effect adapted to an apparatus to obtain an uniform rate of rotation or amplitude for electric motors and electromechanical oscillators which can be sufficiently used for timepieces and instruments, and in which a relatively moving member driven by electrical means is provided, and a control member connected to the junction of a diode and a condenser.

3,699,416

DYNAMIC BRAKING OF WOUND MOTOR POLYPHASE INDUCTION MOTORS

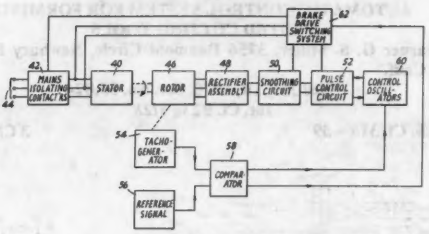
Albert Everett Sloan, and Alistair Gordon Turnbull, both of Gateshead, England, assignors to Sevcon Engineering Limited, Gateshead, Co. Durham, England

Filed July 2, 1971, Ser. No. 159,348

Claims priority, application Canada, May 7, 1971, 112415; Italy, Dec. 3, 1970, 32591/70; Switzerland, Dec. 3, 1970, 17902/70; Japan, Dec. 4, 1970, 45/106892; Germany, Dec. 4, 1970, P 20 59 842.9; France, Dec. 4, 1970, 7043758; Sweden, Dec. 3, 1970, 1640270

Int. Cl. H02p *3/22*

U.S. Cl. 318—211 **16 Claims**



A circuit for effecting dynamic braking of a wound rotor polyphase induction motor comprises rectifier means for rectifying the output of the rotor and switch means which disconnect the stator from the mains supply and connect the rectified rotor output through a d.c. chopper to one or more phase windings of the stator to effect dynamic braking of the motor. The level of direct current in the stator phase windings, and hence the degree of braking, is controlled by the d.c. chopper, which may also be employed to control the driving speed of the motor.

3,699,417

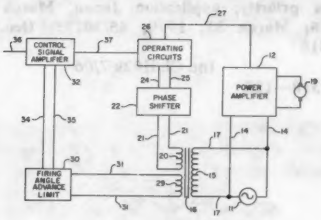
FIRING ANGLE ADVANCE LIMIT FOR THYRISTOR BRIDGE POWER AMPLIFIER

Mikel Jay Messick, Chagrin Falls, Ohio, assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 22, 1970, Ser. No. 83,074

Int. Cl. H02p *5/16*

U.S. Cl. 318—257 **9 Claims**



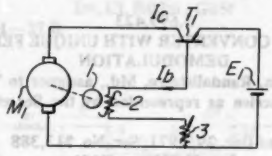
A control system for operating a direct current motor from an alternating current power source includes a power amplifier responsive to a control voltage for applying rectified operating voltage pulses to the motor, means responsive to the magnitude of the control voltage to determine the duration of the operating voltage pulses, and limit means for minimizing the magnitude of the control voltage from 170° in each half cycle of applied operating voltage to 10° in the next half cycle to limit the duration of the pulses.

3,699,418

MOTOR SPEED CONTROLLING APPARATUS

Kaoru Sasabe, Ikeda-shi, and Fujio Oda, Ashiya-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 859,724, Sept. 22, 1969, Pat. No. 3,619,751. This application April 30, 1970, Ser. No. 138,992
Claims priority, application Japan, Sept. 27, 1968, 43/70673; Sept. 27, 1968, 43/70674
Int. Cl. H02p 5/16
U.S. Cl. 318—325 1 Claim



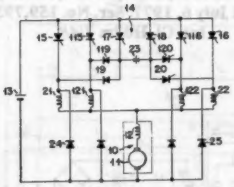
An apparatus for controlling the speed of an electric motor, wherein use is made of an element sensitive to a pressure, the electrical resistance of said element or a voltage developed thereacross being varied in accordance with the pressure imparted thereto, and a centrifugal force produced by a rotary member is imparted to said sensitive element so that the speed of said electric motor is controlled in accordance with variations in the electrical resistance of said sensitive element.

3,699,419

POWER THYRISTOR CHOPPER

Toshimasa Jinzenji; Kenji Ichimura, and Shoji Ito, all of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 11, 1970, Ser. No. 45,365
Int. Cl. H02p 5/34
U.S. Cl. 318—341 16 Claims



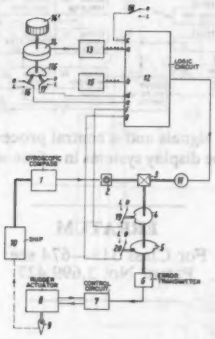
A power thyristor chopper is generally composed of at least two main thyristors which function to repeat turn-on and turn-off in turn during each one cycle operation of the chopper. A capacitor unit is commonly combined with the main thyristors to supply a commutating discharge current for each of them in a reverse direction. There are also provided a plurality of auxiliary thyristors for charging the capacitor unit in alternative polarities from a d.c. voltage source and selectively discharging in the reverse direction through the main thyristors which are in the turn-on state. This chopper is adapted to be preferably installed on a d.c. electric car to adjust its motor voltage or a braking current flowing through its motor.

3,699,420

AUTOMATIC CONTROL SYSTEM CONTROLLING THE COURSE OF A SHIP

Walter Kundler, 157, Schilkseer Strasse, Kiel, and Gerd Hingst, 20, Rohbarg, Kiel-Ellerbek, both of Germany

Filed Oct. 19, 1970, Ser. No. 81,975
Claims priority, application Germany, Oct. 22, 1969, P 19 53 198.7
Int. Cl. G05d 1/08
U.S. Cl. 318—588 10 Claims



The novel automatic control system or automatic pilot controls the course of a ship by means of

1. a gyroscopic indicator for indicating the course or true heading of the ship,
2. a reference value transmitter adjustable in accordance with the desired course angle of the ship,
3. summing means for detecting any positional disagreement of said indicator with said reference value transmitter, such disagreement representing the course error and
4. means causing the course error to control a motor-operable rudder actuator which so actuates the rudder of the ship as to reduce the course error to a minimum. For the purpose of steering the ship along a curved track, as on a winding river, means are provided for driving the reference value transmitter to change the desired course set up therein in the clockwise sense or in the anti-clockwise sense at an adjustable rate. The drive may be effected by a stepping motor actuated by electrical impulses of adjustable frequency.

3,699,421

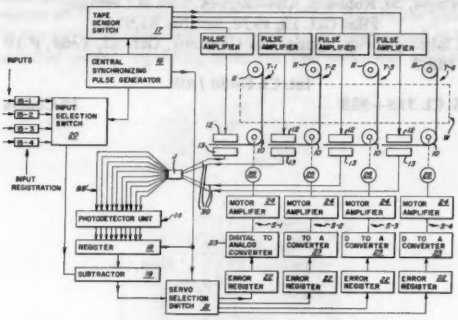
TAPE POSITION SENSOR, OPTICAL

Samuel Stempler, Brooklyn, and Jacob Tellerman, Bayside, both of N.Y., assignors to Kollsman Instrument Corporation, Syosset, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,460
Int. Cl. G05b 1/06
U.S. Cl. 318—640 11 Claims

An indicating arrangement includes a plurality of tape display systems each including a longitudinally movable display tape having a functional scale and a coded pattern in predetermined relation thereon. Optical detection units produce digital output signals representative of the actual position of the coded pattern on the tape. An input register produces digital input signals representative of the required position of

the coded pattern on the tape. Movement of the tape is controlled by servo-positioning means that respond to the digital



input and output signals and a central processor is connected to actuate the tape display systems in a time-sharing sequence.

ERRATUM

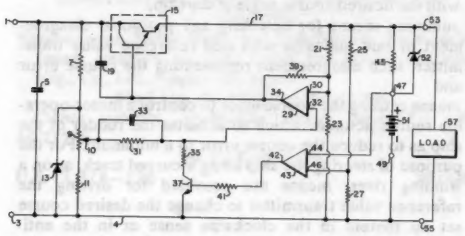
For Class 318—674 see:
Patent No. 3,699,427

3,699,422

AUTOMATIC BATTERY CHARGER

Robert L. Miller, Horsham, and David H. Higgins, Abington, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 11, 1972, Ser. No. 225,452
Int. Cl. H02j 7/02
U.S. Cl. 320—32 **8 Claims**



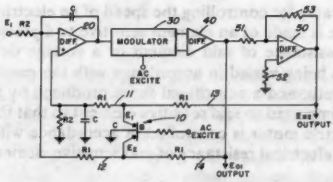
A battery charging circuit includes a first voltage divider means connected across a source of DC potential. An impedance element connects the first voltage divider to an input terminal of an first operational amplifier. Another input terminal of the first operational amplifier is connected to a second voltage divider which is connected across a series combination of a resistor and a battery to be charged. The output terminal of the first operational amplifier is connected to a current regulating device for controlling the magnitude of a charging current flowing from the DC source to a battery. When the terminal voltage of the battery is below a predetermined value, the first operational amplifier effects the flowing of the charging current of a first magnitude, sufficient to rapidly charge the battery through the current regulating device. A second operational amplifier has one input terminal connected to the point between the resistor and the battery, and its other input terminal connected to a third voltage divider. The third voltage divider is connected in parallel with the second voltage divider. The output of the second operational amplifier controls a transistor which is connected to the impedance element. When the battery charging current falls below a predetermined value, the second operational amplifier effects conduction in the transistor which, in turn, effects a change in the signal applied to the first operational amplifier from the impedance element. That change, in turn, causes the magnitude of the charging current to be reduced to a value sufficient only to substantially maintain the battery in its acquired state of charge. Thereafter, when the battery terminal voltage decreases below a predetermined value, the second operational amplifier provides an output signal which is effective to return the transistor to its initial nonconducting state whereby the first operational amplifier again effects the flow of the charging current of the first magnitude through the current regulating device, and the battery is again rapidly charged, but not overcharged.

3,699,423

D. C. TO A.C. CONVERTER WITH UNIQUE FEEDBACK DEMODULATION

Steven Morrison, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 29, 1971, Ser. No. 213,388
Int. Cl. H02m ; H03f
U.S. Cl. 321—8 R **6 Claims**



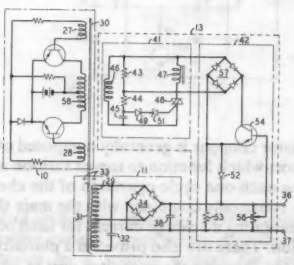
An D.C. to A.C. converter where the output A.C. signals which are 180 degrees apart are rectified in an integrated chopper and applied to a differential amplifier with the D.C. input in order to minimize sources of error. The signal from the differential amplifier is modulated in a semi-conductor modulator and applied through another differential amplifier to the output.

3,699,424

OVERVOLTAGE PROTECTION OF DC TO DC CONVERTERS USING FERRORESONANCE

Harry Patrick Hart, Whippany; Robert John Kakalec, Madison, and Ralph Walk, Parsippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 6, 1971, Ser. No. 159,793
Int. Cl. H02m 7/48
U.S. Cl. 321—11 **5 Claims**



The frequency characteristic of a ferroresonant regulator is shown to have a critical jump frequency above which the output voltage of the regulator takes a sudden drop. A regulated voltage converter utilizes this discontinuity to provide auto-

matic overvoltage protection. An inverter drives a ferroresonant regulator and a feedback loop controls the frequency of the inverter in response to output voltage. A short in the feedback loop drives the frequency above the critical jump frequency to provide automatic voltage limiting.

3,699,425

CONVERTER CONNECTIONS

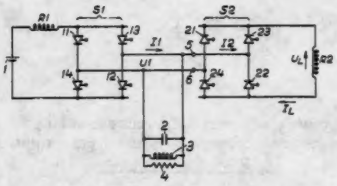
Bo Hermansson, and Kjeld Thorborg, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 7, 1971, Ser. No. 141,173

Claims priority, application Sweden, May 28, 1970, 7335/70

Int. Cl. H02m ; G05f

U.S. Cl. 321—27 R **7 Claims**



A single or multiphase converter connection includes a controlled first converter having an AC side and a DC side. A first reactor connects the DC side to a DC source. A capacitor is connected to the AC side of the first converter. A controlled current circuit is formed of a second reactor and controlled rectifiers connected to the second reactor to control the current therethrough. A control means is provided for firing said rectifiers with an adjustable delay angle so that the current circuit generates a variable capacitive current.

3,699,426

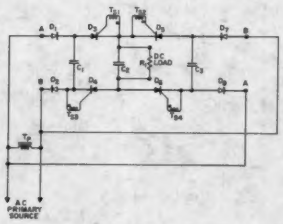
HIGH ISOLATION A.C. TO D.C. CONVERTER

Ronald M. Bauman, 415 Saratoga Drive, Cherry Hill, N.J.

Filed May 20, 1971, Ser. No. 145,364

Int. Cl. H02m 7/20

U.S. Cl. 321—27 R **5 Claims**



The invention converts alternating current (A.C.) power to direct current (D.C.) power and achieves high isolation between the A.C. source and D.C. load without the use of a high power transformer. The invention achieves high isolation by the use of capacitors, diodes, and silicon controlled rectifiers (SCR) which are so arranged that an effectively open circuit is constantly maintained between the A.C. source and the D.C. load. The invention also makes use of a small low power phasing transformer connected across the A.C. source to render the SCR's conductive or nonconductive at the appropriate times.

3,699,427

PULSE GENERATING DIRECT-CURRENT MEASURING BRIDGES

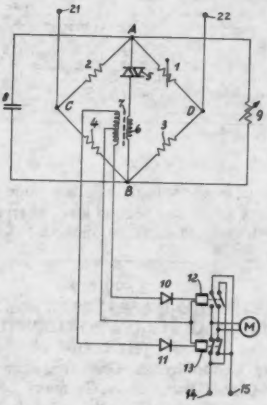
Hermann Friedrich Albrecht, Hotzum, and Karl Peter Strauss, Braunschweig, both of Germany, assignors to Rollei-Werke Franks & Heidecke, Braunschweig, Germany

Filed July 1, 1971, Ser. No. 158,956

Claims priority, application Germany, July 7, 1970, P 20 37 518.2

Int. Cl. G05b 11/01

U.S. Cl. 318—674 **7 Claims**



A measuring bridge regulator in which the bridge diagonal circuit has a capacitor, and also, in parallel with the capacitor, a break-through device and the primary winding of an impulse transformer. When the bridge is balanced, there is no charge on the capacitor. When imbalance occurs, a charge builds up in the capacitor, and when the difference in potential in the bridge circuit becomes sufficiently great to cause the break-through device to fire, the capacitor discharges through the primary of the impulse transformer. This creates a pulse in the secondary winding of the transformer, which pulse operates a relay to provide power for an adjusting motor in a direction to tend to restore balance to the measuring bridge.

3,699,428

NUCLEAR MAGNETIC RESONANCE SPECTROMETER SYSTEM

John Bryant Leane, Beaconsfield, and Peter Higham, High Wycombe, both of England, assignors to Perkin-Elmer Limited, Beaconsfield, England

Filed July 7, 1969, Ser. No. 839,423

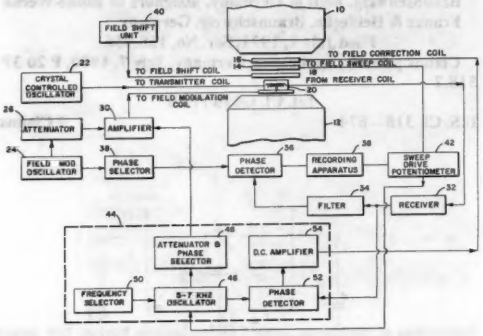
Claims priority, application Great Britain, July 4, 1968, 31,954/68

Int. Cl. G01n 27/78

U.S. Cl. 324—0.5 R **6 Claims**

A nuclear magnetic resonance system is provided which comprises a N.M.R. spectrometer having field modulation and an accessory means adapted to be operationally coupled to the spectrometer for providing alternatively spin decoupling or field locking facilities. The accessory means includes a variable frequency oscillator that is coupled to the field modulation means of the N.M.R. spectrometer through a variable attenuator. The variable frequency oscillator is swept in synchronism with the field modulation means so that a working sideband component exhibiting a fixed frequency is

generated during this sweep. The attenuator is adjusted to attenuate the oscillatory signal to one level when the spectrometer is operated in the spin decoupling mode and to attenuate the oscillatory signal to a second level when the spectrometer is operated in the field stabilization mode.



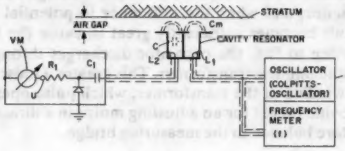
3,699,429
A METHOD AND APPARATUS FOR TESTING GEOLOGICAL STRATA FOR IDENTIFICATION THEREOF

Walter Ratz, Gelsenkirchen, Germany, assignor to Bergwerksverband GmbH, Essen-Kray, Germany

Continuation-in-part of Ser. No. 732,730, May 28, 1968, abandoned. This application Aug. 13, 1970, Ser. No. 63,413

Int. Cl. G01v *3/08*

U.S. Cl. 324—5 **3 Claims**



This invention relates to a method and apparatus for testing geological strata by means of a measuring system comprising a high frequency oscillatory circuit having a radiator cooperating with the test material to form a measuring capacitor influencing the resonant frequency and resonant voltage of the oscillatory circuit, the effects of a changing air gap between the radiator and the test material being taken into account.

3,699,430
ELECTROMAGNETIC READ AND WRITE HEAD TEST DEVICE AND METHOD USING A MINUTE BODY OF MAGNETIC RECORDING MATERIAL

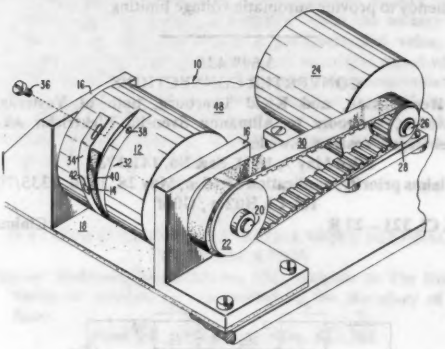
Karlis Kruklitis, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 5, 1971, Ser. No. 112,929

Int. Cl. G01r *35/00*

U.S. Cl. 324—34 R **17 Claims**

A controlled magnetic field source is provided, the source being formed of a small body of accurately shaped, magnetic recording tape precisely disposed and magnetically isolated on the periphery of a rotatable drum. A particularly singular embodiment of this invention also provides read and write head holders to contain respective read and write heads, the holders being adjustable to accurately position a preselected head track effectively adjacent the circumferential path described by the magnetic recording tape as the drum is rotated.



3,699,431
SELECTOR CIRCUIT FOR DETERMINING FAULTS IN POLYPHASE TRANSMISSION SYSTEMS

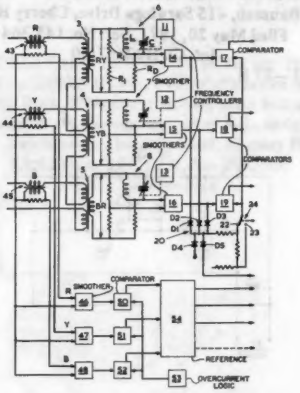
Eric Paddison; Christopher George Wilson, and Frederick Martin Gray, all of Stafford, England, assignors to The English Electric Company, London, England

Filed Dec. 10, 1969, Ser. No. 883,810

Claims priority, application Great Britain, Dec. 10, 1968, 58,554/68

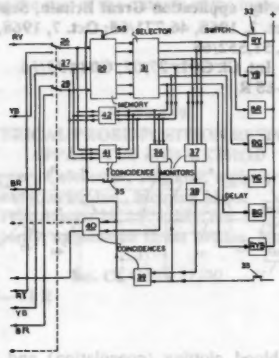
Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **9 Claims**



The invention provides a selector system for determining which phase or phases of a polyphase power transmission system are affected by a fault. The fault results in a fault current in the affected phase (phase-to-ground fault) or phases (phase-to-phase fault). To distinguish these changes from the existing phase currents due to normal loads, the quantities monitored are stored (phase and amplitude) and any changes in them are inspected to see whether a fault has occurred and, if so, what type of fault it is. Preferably, the "phase-to-phase"

currents are the quantities monitored. The pattern of any substantial changes in these quantities establishes a fault pattern indicative of the nature of the fault. Means may also be provided for following developing faults. A measuring unit may be connected to the appropriate phase or phases following identification of the fault.

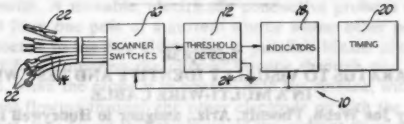


3,699,432

ELECTRICAL SHOCK HAZARD DETECTION SYSTEM WITH STATION SCANNING AND INDICATING MEANS

Verne R. Brown, Ann Arbor, Mich., assignor to Environment Metrology Corporation, Ann Arbor, Mich.

Filed June 25, 1970, Ser. No. 49,654
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **10 Claims**



A scanning shock hazard detector comprising a plurality of flexible leads connectable to devices to be monitored, switches connecting the leads to a threshold detector, a plurality of warning lamps and a clock system for sequentially and synchronously closing the switches and enabling the warning lamps so that a current potential on one of the leads causes a lighting of the lamp associated with that lead. The lamps remain lighted until manually extinguished. A remote loudspeaker is also activated by a warning condition. The loudspeaker is quieted at the same time the lamp is extinguished.

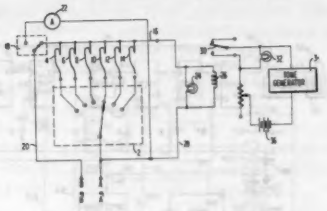
3,699,433

SHORT CIRCUIT LOCATOR APPARATUS INCLUDING A PLURALITY OF INTERMITTENTLY OPERATED CIRCUIT BREAKERS

Raymond Peter Smith, Jr., P.O. Box 294, South Williamsport, Pa.

Filed Nov. 24, 1970, Ser. No. 92,388
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **6 Claims**

A method and apparatus for locating short circuits, primarily in a vehicle, which comprises of placing a pair of test leads across the defective fuse in a shorted circuit, the test leads being connected to a plurality of circuit breakers through a selector switch for selecting one of the circuit breakers. A relay in parallel with the selected circuit breaker operates a switch which controls a light and tone generator, such that when the circuit breaker is placed across the fuse terminals of a shorted circuit, an audible and visual signal will be generated by the tone generator and light.

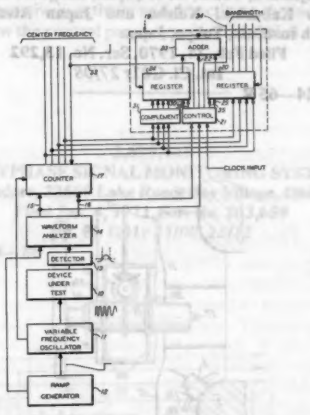


3,699,434

BANDWIDTH AND CENTER FREQUENCY TESTING USING PREDETERMINED AMPLITUDE POINTS

Douglas B. Palmer, Graham, N.C., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,386
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **7 Claims**



A frequency responsive device, such as a tuned amplifier, filter, etc., is tested for center frequency and bandwidth. A decreasing sweep frequency signal is applied to the device and the output detected. A waveform analyzer produces a first pulse when the detected signal reaches a predetermined amplitude and a second pulse when the detected signal falls below the predetermined amplitude. The first and second pulses trigger or operate a counter which counts the cycles of sweep frequency signal for a predetermined duration in response to each pulse. The sum in the counter is indicative of the center frequency. The count after the first pulse is multiplied by 2 and added to the complement of the sum in the counter after the second pulse to produce a remainder which is multiplied by 2 to indicate the bandwidth.

3,699,435

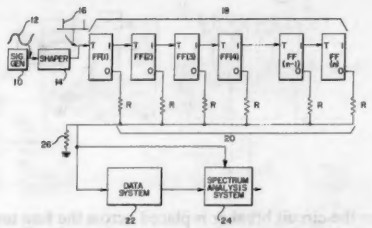
SIGNAL SPECTRUM GENERATOR

Robert E. Gardner, Temple Hills, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 26, 1971, Ser. No. 166,152
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **2 Claims**

This invention consists of a plurality of dividers connected in series, the outputs of which are added and provide (by

Fourier series expansion of square waves) a spectrum of the harmonics of the fundamental frequency. At this comb of



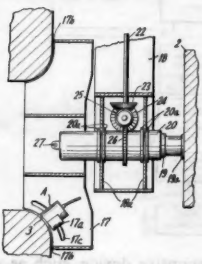
spectral lines is of precisely known frequencies and amplitudes, an entire frequency band of interest of a data system may be calibrated in a single operation.

3,699,436

REMOTELY CONTROLLABLE DEFECT DETECTOR OF ELECTRIC RESISTANCE TYPE

Hiroji Shigematsu; Tomio Yamaguchi, both of Kobe; Hisanobu Fukue, Kakogawa; Hiroshi Ogawa; Takashi Hashimoto; Kenichi Murakoshi; Susumu Suguri, all of Mito, and Tsutomu Fujimura, Tokai, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 24, 1970, Ser. No. 13,292
Int. Cl. G01r 27/08
U.S. Cl. 324—65 R **13 Claims**



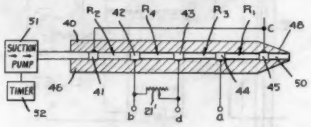
A remotely controllable defect detector, of the electric resistance type, includes a relatively elongated control rod, a guide frame supported at one end of the rod and a contact assembly including a body member supported by the frame. The body member carries a pair of spaced electric current probes for contact with spaced points of an electrically conductive object or body to be checked, to provide a flow of current through the checked body between the contact points, and the body member carries a pair of spaced voltage probes for contact with the checked body to detect the potential difference between points of the checked body. The contact assembly is preferably adjustably mounted on the guide frame, and the guide frame is adjustable relative to the control rod. Control means are provided at the end of the control rod remote from the end thereof carrying the guide frame, and are operable to adjust the contact assembly relative to the control rod. The control means may include, for example, a manually operable member connected to gearing operable to rotate the contact assembly about an axis perpendicular to the control rod. A hydraulic pressure actuator or an electromagnet may be used to press the guide frame firmly into engagement with the body to be checked.

3,699,437

BLOOD COAGULATION DETECTION METHOD AND APPARATUS

Amiram Ur, 79 North End House, Fitzjames Avenue, London, England

Filed Aug. 21, 1969, Ser. No. 863,411
Claims priority, application Great Britain, Sept. 27, 1968, 46,141/68; Oct. 2, 1968, 46,771/68; Oct. 7, 1968, 47,540/68; Oct. 30, 1968, 51,552/68
Int. Cl. G01r 27/02; G01n 33/16
U.S. Cl. 324—65 R **15 Claims**



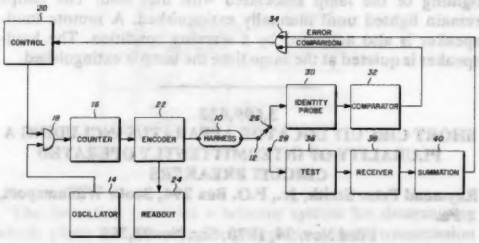
Detecting blood clotting (coagulation) and determining clotting time by comparing the electrical resistance of two parts of a liquid blood sample, one of which is treated to delay or prevent its coagulation. Time or rate of clotting is determined by the rate of change of electrical resistance or impedance of the sample falling to a minimum or substantially zero at the commencement of coagulation whereafter the comparative impedance begins to increase with time. Coagulation is detected by the incidence of minimum comparative impedance. Apparatus includes an electrical bridge measuring circuit having a test cell containing an untreated part of the blood sample in one arm of the bridge and a similar test cell in the other arm of the bridge containing the part of the sample which is treated to delay or prevent coagulation. Electrodes in each test cell place corresponding parts of the blood sample in series circuit with their respective arms of the electrical bridge.

3,699,438

APPARATUS TO VISUALLY IDENTIFY AND TEST WIRES IN A MULTI-WIRE CABLE

Larry Joe Webb, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.

Filed Aug. 21, 1970, Ser. No. 65,762
Int. Cl. G01r 31/02
U.S. Cl. 324—66 **6 Claims**



In a cable having the wires of one end prewired and the wires of the other end ready to be connected to another component, the system disclosed allows an operator to select any

wire in the cable without prior marking. The system identifies the wire by clocking a counter until the circuit completed by the wire disables the counter. A readout interrogates the counter and identifies the placement of the wire to the operator. Each wire is tested for correct placement by comparison to a reference line into a logic gate for each wire of the cable and checking the sum of the outputs of the logic gates.

3,699,439

ELECTRICAL PROBE-POSITION RESPONSIVE APPARATUS AND METHOD

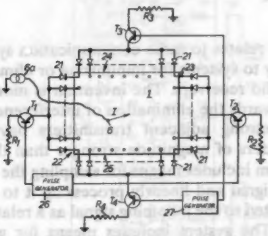
John A. Turner, Colchester, England, assignor to Automatic Radio Manufacturing Inc., Melrose, Mass.

Filed March 10, 1970, Ser. No. 18,174

Claims priority, application Great Britain, March 13, 1969, 13,341/69

Int. Cl. G01n 27/00

U.S. Cl. 324—71 R **12 Claims**



Position responsive apparatus is disclosed comprising a sheet of substantially uniform resistivity having first and second parallel, linear electrodes in electrical contact therewith. A movable, electrically conductive probe is energized from one pole of a current source whose other pole is connected to the two electrodes in parallel. Means are provided for comparing the current flowing through one electrode, when the probe is in contact with the surface, with the current flowing through the other electrode or with the total current. It is found that the ratio of the current through the first electrode to the current through the second electrode corresponds to the ratio of the distance of the probe contact point from the second electrode to the distance of the said point from the first electrode. A second pair of linear electrodes, arranged perpendicular to the first pair so as to form therewith the four sides of a square, may be provided. If the second pair of electrodes are energized, with respect to the probe, in the same manner as the first pair but alternately therewith, then x and y co-ordinates of the point of contact between the probe and the surface may be produced.

3,699,440

ANALYZER FOR SUCCESSIVELY TESTING THE CONTROL CIRCUITS OF A CONTROL PANEL

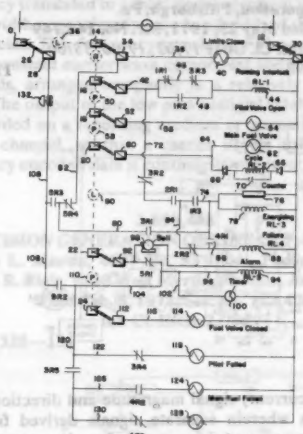
Martin L. Johnson, 7521 Cherokee Road, Richmond, Va., and Richard L. Leclercq, 532 Longstreet Avenue, Brielle, N.J.

Filed Oct. 19, 1970, Ser. No. 81,976

Int. Cl. G08b 19/00; G01r 31/00, 15/12

U.S. Cl. 324—73 **18 Claims**

Plural indicator circuits which correspond and are connected to control circuits of a control panel are activated and de-activated as the control panel proceeds through its control sequence, and special interconnected control circuits within



the unit successively activate and de-activate the indicator circuits to show the control panel circuit which failed.

3,699,441

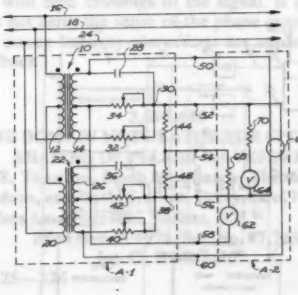
POLYPHASE SIGNAL MONITORING SYSTEM

John R. Linders, 23609 Lake Road, Bay Village, Ohio

Filed Jan. 4, 1971, Ser. No. 103,659

Int. Cl. G01r 25/00, 23/12

U.S. Cl. 324—86 **60 Claims**

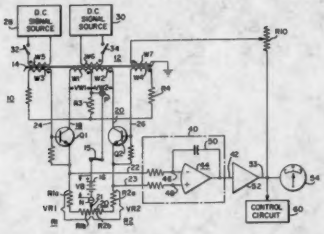


A signal monitoring system for monitoring and measuring the value of certain parameters of a polyphase alternating-current signal. The monitoring system includes a circuit arrangement for developing from a polyphase supply line a pair of signals which may be defined by a pair of phasors having common midpoints. Each of these signals is then resolved into a component signal which is shifted from the corresponding signal by a predetermined number of degrees. The values of the component signals may then be measured and compared to determine parameters, including the positive and negative phase sequence voltage, current, and power, as well as the frequency, of the polyphase alternating-current signal.

3,699,442
BI-DIRECTIONAL SIGNAL DETECTOR WITH INPUT/OUTPUT ISOLATION

John A. Riley, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1971, Ser. No. 146,749
Int. Cl. G01r 17/02, 17/06, 33/00
U.S. Cl. 324—98 11 Claims

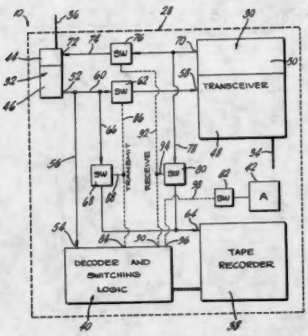


DC (direct current) signal magnitude and direction detection apparatus wherein separate signals derived from the respective primary energizing paths for alternate opposite magnetic saturation of a magnetic flux coupled oscillator, are compared to provide an indication of the magnitude and direction of net DC signal input applied to an input winding or windings of the oscillator.

3,699,443
RADIO CONTROL AND REPEATER COMMUNICATION SYSTEM

Ronald E. Weger, 3218 South Cambridge Road, Lansing, Mich.

Filed March 2, 1970, Ser. No. 15,670
Int. Cl. H04b 7/20
U.S. Cl. 325—4 16 Claims

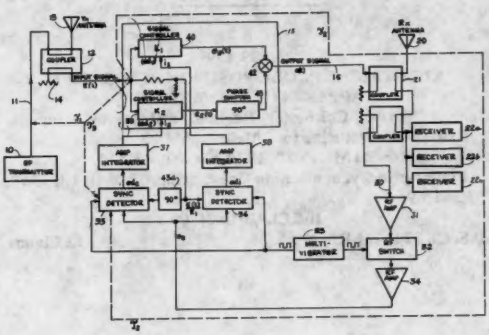


A communications system particularly adapted for use by police officers and including a portable transceiver, first and second mobile transceivers, and a recording unit. Code generator means is provided which is operatively associated with the portable transceiver. Decoding and switching means is also provided which is controlled by the code generator means and which selectively controls the first and second mobile transceivers and the recording unit. Additional auxiliary safety units may also be provided which are controlled by the code generator means and the decoding and switching means.

3,699,444
INTERFERENCE CANCELLATION SYSTEM

Rabindra N. Ghose, Los Angeles, and Walter A. Sauter, Malibu, both of Calif., assignors to American Nucleonics Corporation, Glendale, Calif.

Filed Feb. 17, 1969, Ser. No. 799,781
Int. Cl. H04b 1/56
U.S. Cl. 325—21 2 Claims

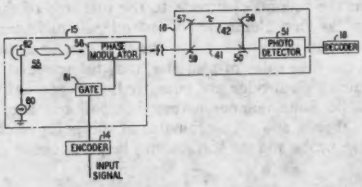


This invention relates to radio communication systems and more particularly to systems for minimizing or eliminating interference in radio receivers. The invention is more particularly directed towards the elimination of interference in radio receivers from strong adjacent transmitters having signal levels several orders of magnitude stronger than the wanted signal. This system includes means for sampling the unwanted or interference signal and linearly processing it to develop a signal that is related to the incoming signal as a relatively time invariant ratio. The system includes means for adding the derived signal to the received signal to effectively cancel the interference signal.

3,699,445
FREQUENCY SHIFT KEYED COMMUNICATION SYSTEM

Tracy Stewart Kinsel, Bridgewater Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1970, Ser. No. 85,890
Int. Cl. H04l 27/10; H04b 9/00
U.S. Cl. 325—30 10 Claims



The frequency shift keying (FSK) format used in the prior art, radio frequency carrier, PCM communication systems generally comprises a train of pulsed carriers having sufficiently different frequencies so as to permit frequency separation and identification by means of either filters or frequency discriminators. At optical frequencies, however, the relatively small amount of frequency shift readily obtainable by the use of available optical devices operating on the output of a laser may not allow complete frequency separation by an amount sufficient to employ either of these conventional detection systems. In the system described herein, the received pulse train is divided into two pulse trains, one of which is delayed the equivalent of one pulse repetition period relative to the

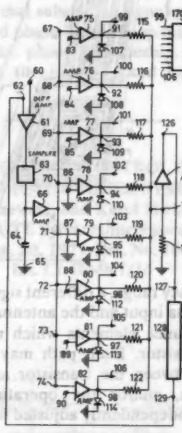
other. The two pulse trains are then coupled to a frequency mixer whose output is indicative to the frequency shift between pulses in adjacent time slots. Means are provided at either the transmitter or the receiver for converting between the standard binary-encoded signal and a differential binary encoded signal.

3,699,446

DIFFERENTIAL PULSE CODE MODULATOR SYSTEM WITH CYCLIC, DYNAMIC DECISION LEVEL CHANGING

Philippe Sainte-Beuve, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,268
Claims priority, application France, Dec. 31, 1969, 6945677
Int. Cl. H04l 27/02
U.S. Cl. 325—38 A **5 Claims**



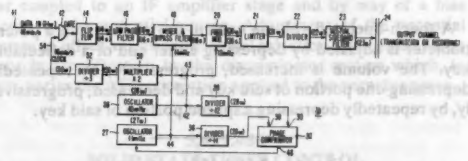
A device for the transmission of an information signal by means of pulse code modulation features a quantizing circuit controlled by a control circuit so that the decision levels of the quantizing circuit are cyclically changed between predetermined minimum and maximum values.

3,699,447

WIDEBAND FREQUENCY MODULATION COMMUNICATIONS SYSTEM

William Thomas Frost, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 5, 1971, Ser. No. 104,039
Int. Cl. H04b 1/00
U.S. Cl. 325—45 **8 Claims**



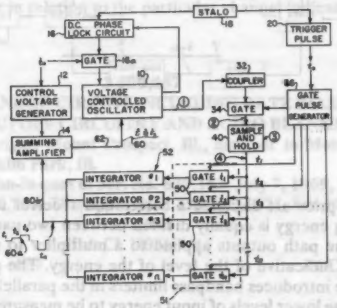
A duobinary data input having a first signal spectrum in a relatively low frequency range is fed to a mixer and bandpass filter. The mixer and bandpass filter frequency translates the first signal spectrum to obtain a second signal spectrum separated upwardly in frequency range from the first spectrum. The signal of the second spectrum frequency modulates a carrier wave having a frequency that is near to the upper frequency limit of the second spectrum, so that only a single pair of sidebands is produced by each modulating frequency component. The frequency modulated signal is then passed through a limiter, a divider, and a low pass vestigial sideband filter, respectively, so that the frequency modulated carrier is frequency translated to a third signal spectrum which occupies a bandwidth approximating the bandwidth of the first band of frequencies. This frequency translated FM carrier wave contains a constant carrier wave component and lower frequency sidebands, arranged compactly in a relatively narrow bandwidth. The output of the low pass vestigial sideband filter may be recorded on a recording medium or transmitted in a band limited channel, so that a carrier usable for clocking the duobinary encoded data is continuously present.

3,699,448

PRECISION GENERATION OF LINEAR F. M. SIGNAL

Gregory L. Martin, 4607 No. 53 Drive, Phoenix, Ariz., and Lloyd R. Blair, 1130 West Myrtle, Phoenix, Ariz.

Filed Feb. 8, 1971, Ser. No. 113,420
Int. Cl. H03b 23/00
U.S. Cl. 325—131 **5 Claims**



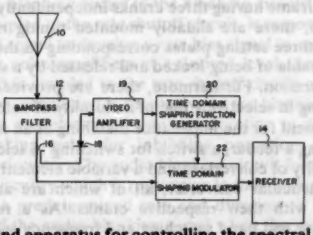
The invention achieves a linear waveform that is swept in frequency with great precision by means of a servo control that uses an error signal derived from the measurement of the actual phase of the swept frequency waveform at equal time intervals. These time intervals are chosen so the phase should be multiples of 2π at the sample times. These phase values coincide with zero crossings of the signal. If the signal amplitude is not zero, the sense of the phase errors is detected, and then sweep linearity corrections are applied in a closed loop feedback.

3,699,449

TIME DOMAIN MODULATOR FOR SPECTRUM SHAPING OF PULSED WAVEFORMS

Kenneth E. Tauscher, South Merrimack; Theodore F. Roome, Jr., Hudson, and David S. Coon, Derry, all of N.H., assignors to Sanders Associates Inc., Nashua, N.H.

Filed Nov. 9, 1970, Ser. No. 87,719
Int. Cl. H04b 1/10
U.S. Cl. 325—324 **12 Claims**



A method and apparatus for controlling the spectral content of signals entering a radio frequency receiver. The frequency

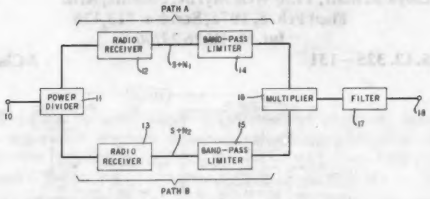
resolution of the receiver is improved by reshaping an incoming pulse waveform to a preselected pulse waveform having spectral characteristics which are defined and desirable thus permitting optimization of receiver characteristics without substantial loss of sensitivity.

3,699,450

APPARATUS FOR MEASURING LOW LEVEL POWER

Attilio Joseph Rainal, Convent, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 26, 1970, Ser. No. 67,033
Int. Cl. G01t
U.S. Cl. 325—363 **2 Claims**



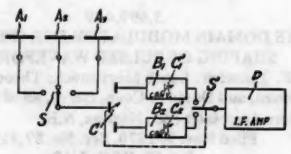
The prior art discloses a correlation receiver in which incoming energy is equally divided between two parallel paths, with the path outputs applied to a multiplier to produce an output indicative of the level of the energy. The present disclosure introduces bandpass limiters in the parallel paths, thus enabling lower levels of input energy to be measured.

3,699,451

ANTENNA SELECTION AND IMPEDANCE MATCHING APPARATUS

Tamaki Ohaski, 1629 Tanashi-shi, Tokyo, Japan

Filed Nov. 8, 1968, Ser. No. 774,394
Claims priority, application Japan, Nov. 11, 1967, 42/72253
Int. Cl. H04b *1/18*
U.S. Cl. 325—368 **6 Claims**



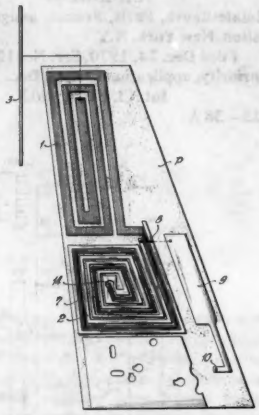
On a frame having three cranks independently adjustable by rotation, there are slidably mounted tuning members each having three setting plates corresponding to the three cranks and capable of being locked and released by a single pushbutton operation. Furthermore, there are provided a switch for switching in selectively one of a plurality of antennae, a variable element for the impedance matching of an antenna circuit including a feeder, a switch for switching in selectively one of a plurality of converters, and a variable element for the tuning of a particular converter, all of which are arranged to be moved with their respective cranks. As a result, antenna switching and band switching and frequency selection can be effected simultaneously by a single operation.

3,699,452

ACTIVE ANTENNA ARRANGEMENT FOR A PLURALITY OF FREQUENCY RANGES

Heinz Lindenmeier, Munich, and Hans-Heinrich Meinke, Gauting, both of Germany, assignors to Hans Kolbe & Co., KG, Bad Salzdetfurth, Germany

Filed Feb. 16, 1970, Ser. No. 11,569
Claims priority, application Germany, April 18, 1969, P 19 19 749.0
Int. Cl. H01q *1/26*; H04b *1/18*
U.S. Cl. 325—367 **13 Claims**



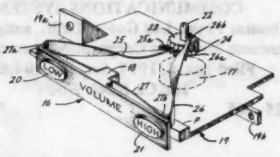
For each frequency range, a different signal path is provided between the antenna input and the antenna output. Each path has passive impedance elements which receive the radiant energy and a transistor. Each path may have independent noise matching between the transistor and the passive impedance elements, and/or the operating point of each transistor may be independently adjusted for each path.

3,699,453

BI-DIRECTIONAL OPERATING MECHANISM

Arthur Berenbaum, Holland, and Robert M. McDonough, Philadelphia, both of Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed April 29, 1971, Ser. No. 138,548
Int. Cl. H03g *3/02*
U.S. Cl. 325—397 **6 Claims**



A touch-operated volume control device in which a potentiometer is adjusted by depressing either end of a deflectable key. The volume is increased, progressively, by repeatedly depressing one portion of said key and decreased, progressively, by repeatedly depressing a spaced portion of said key.

3,699,454

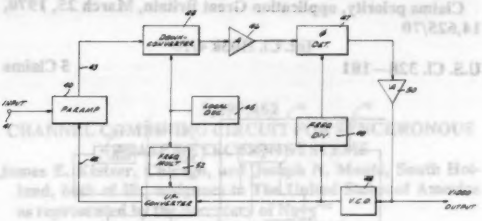
DEGENERATE PARAMETRIC AMPLIFIER RECEIVER

Thomas Hudspeth, Malibu, and Harold A. Rosen, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 30, 1970, Ser. No. 7,279
Int. Cl. H03f *7/00*
U.S. Cl. 325—421 **4 Claims**

A high frequency receiving system for angle modulated signals is disclosed. A degenerate parametric amplifier is com-

bined with unique circuitry and operated in a manner which provides low-noise amplification and detection of angle modulated signals. As in the case of other degenerate parametric amplifiers the pump frequency is maintained at exactly twice the signal frequency. However, the pump and signal are combined in such a way that substantial signal carrier cancellation occurs. A high speed phase locked loop maintains the proper pump frequency and phase relationship. A residual error signal derived from the phase locked loop comprises the receiver output.

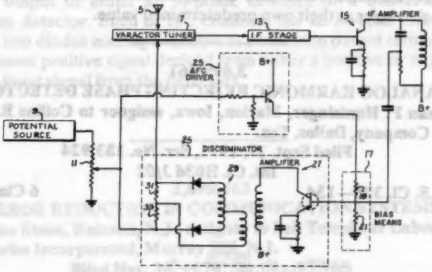


3,699,455

AUTOMATIC FREQUENCY CONTROL CIRCUITRY FOR A VARACTOR TUNER SYSTEM

William Frank Kruszewski, and Karol Siwko, both of Batavia, N.Y., assignors to GTE Sylvania Incorporated

Filed Jan. 20, 1971, Ser. No. 108,033
Int. Cl. H04b *1/16*
U.S. Cl. 325—423 **10 Claims**



In a signal receiver employing a varactor tuner responsive to alterations in a potential source for effecting signal selection, an automatic frequency control (AFC) system includes a discriminator coupled to the varactor tuner and having an amplifier coupled to an IF amplifier stage and by way of a bias means to the potential source. Adjustment of the potential source to effect variations in signal selection also causes variations in amplification by the discriminator system which, in turn, varies the AFC correction applied to the varactor tuner.

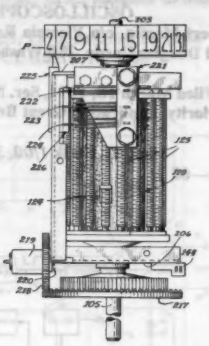
3,699,456

SOLID STATE TUNER CONTROL

Edward L. Midgley, Carol Stream, Ill., assignor to Standard Kollman Industries, Inc., Melrose Park, Ill.

Continuation-in-part of Ser. No. 839,163, July 7, 1969, Pat. No. 3,601,703. This application April 12, 1971, Ser. No. 133,265
Int. Cl. H04b *1/06*
U.S. Cl. 325—455 **9 Claims**

In a television channel selector apparatus, the shiftable channel or band controlling movement of a cam follower is effected through indexed rotary movement of a set of cam elements, each cam element comprising a replaceable channel indicating tab having a cam portion configured to position the cam follower in relation to the particular channel indicated by such tab.

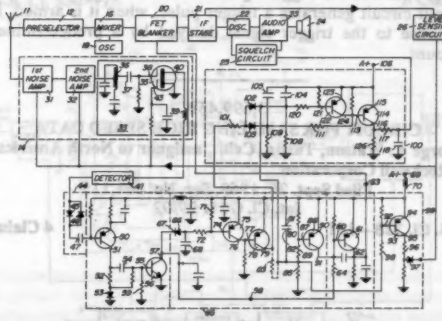


3,699,457

NOISE BLANKER CIRCUIT INCLUDING RATE BIAS AND RATE SHUTOFF CIRCUITRY AND AUDIO BLANKING

Larry R. Wright, Mount Prospect, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 839,163, July 7, 1969, Pat. No. 3,601,703. This application Aug. 11, 1971, Ser. No. 170,862
Int. Cl. H04b *1/10*
U.S. Cl. 325—479 **16 Claims**

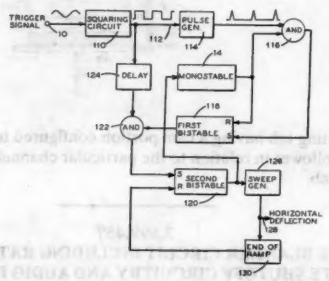


A noise blanking circuit for decreasing the impulse noise in a receiver includes a noise channel which develops blanking pulses in response to impulse noise. The noise pulses are coupled to a stage in the signal path for blanking the signals coupled therethrough to eliminate the reproduction of impulse noise. A rate shutoff circuit includes first and second timing circuits which are responsive to the repetition rate of the blanking pulses, and the duration of a series of pulses respectively, to develop a rate shutoff signal which inhibits the coupling of the blanking pulses to the blanking circuit. A rate bias circuit, coupled to the rate shutoff circuit, is responsive to the rate shutoff signal to develop a rate bias signal to maintain the gain of the noise amplifiers at a desired level. An audio blanking circuit is coupled to the rate shutoff circuit and the receiver squelch circuit and is responsive to the blanking pulses exceeding a predetermined rate and duration to develop an audio blanking pulse for inhibiting operation of the receiver audio circuitry. The audio blanking circuit further includes timing circuitry which is responsive to the blanking pulses exceeding a predetermined rate and duration to inhibit development of the audio blanking signal when the rate shutoff function is operative.

3,699,458
JITTER FREE TRIGGER CIRCUIT FOR A SAMPLING OSCILLOSCOPE

Edward Albert Martin, c/o Victoria Road, Farnborough, England, and Douglas Garde, 280 Washington Street, Woburn, Mass.

Filed March 10, 1971, Ser. No. 122,878
Claims priority, application Great Britain, March 12, 1970, 11,997/70
Int. Cl. H03k 1/00, 3/04
U.S. Cl. 328—60 1 Claim

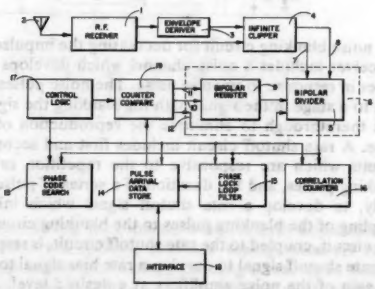


In a trigger pulse generator for an oscillator jitter is liable to occur in the trigger pulses because of uncertainties in the timing of the end of the hold-off signal relative to the instants at which a trigger signal reaches a trigger level. Jitter is eliminated by arming an output circuit when the hold-off signal ends and the trigger signal reaches the trigger level. The output circuit generates a trigger pulse, when it is armed, in response to the trigger signal delayed by a predetermined amount.

3,699,459
CIRCUIT FOR SAMPLING HIGH SPEED DATA

George A. Watson, Tustin, Calif., assignor to North American Rockwell Corporation

Filed Sept. 25, 1969, Ser. No. 861,115
Int. Cl. G01r 29/02
U.S. Cl. 328—151 4 Claims

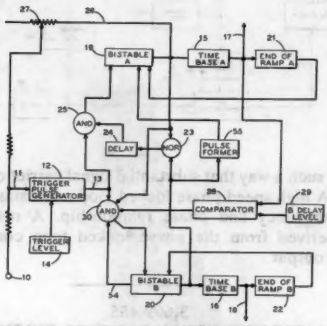


The invention is a data divider for sampling high speed data received from master and slave transmitters in a long-range navigational system for generating slower speed data which can be processed by a relatively lower speed system to determine the location of the receiver. The system also generates clock signals for the low speed system. The data is synchronized with the clock signals.

3,699,460
OSCILLOSCOPE TIME BASE CIRCUITS

Paul Vincent Marie Brigstock Trasler, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed March 25, 1971, Ser. No. 127,977
Claims priority, application Great Britain, March 25, 1970, 14,625/70
Int. Cl. H03k 4/10
U.S. Cl. 328—181 5 Claims

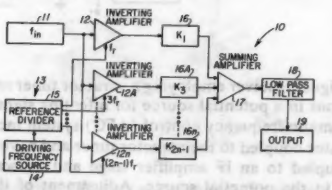


An oscilloscope time base circuit providing two time bases, both triggered from a single trigger signal. A logic circuit ensures that the time bases trigger alternately: one time base triggers when the trigger signal next reaches a predetermined value after a preset time has elapsed since the other time base triggered, and the other time base triggers when the trigger signal next reaches a predetermined value after both time bases have returned to their starting states. The trigger signal's predetermined value also alternates so that the time bases each trigger at their own predetermined value.

3,699,461
ANALOG HARMONIC REJECTING PHASE DETECTOR

Dean P. Huntsinger, Marion, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Sept. 27, 1971, Ser. No. 183,924
Int. Cl. H03d 3/02
U.S. Cl. 328—134 6 Claims



An analog harmonic rejecting phase detector with even harmonic rejection achieved through a fundamental frequency, f_r, phase detector section and rejection of the stronger odd harmonic signal content passed from the input signal through the fundamental frequency section. It includes a plurality of odd harmonic frequency phase detector sections such as $3f_r$, $5f_r$ and possibly other odd harmonic sections up to and including a $(2n-1)f_r$ odd harmonic section. The reference signals $3f_r$, $5f_r$, etc., are square waves so phase related relative to f_r as to achieve mutual cancelling with like harmonic content in the signal being passed through an invert-noninvert amplifier of the fundamental frequency section and passed to a summing amplifier. This requires an attenuator circuit after an invert-noninvert amplifier in each odd harmonic section to properly balance signal strength to the strengths of their respective

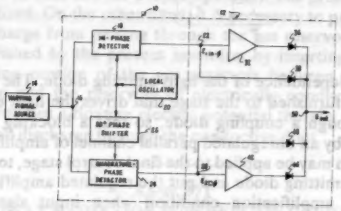
counterparts passed through the fundamental frequency section. The resulting output of the summing amplifier is so integrated through a low pass filter as to present a plus or minus output voltage indicative of the input signal, f_{in}, phase lead or lag and the magnitude of phase displacement relative to the square wave reference signal f_r.

3,699,462

CHANNEL COMBINING CIRCUIT FOR SYNCHRONOUS PHASE DETECTION SYSTEMS

James E. Kietzer, Chicago, and Joseph N. Mente, South Holland, both of Ill., assignors to The United States of America as represented by the Secretary of Navy

Filed June 1, 1971, Ser. No. 148,564
Int. Cl. H03d 3/18
U.S. Cl. 329—112 6 Claims



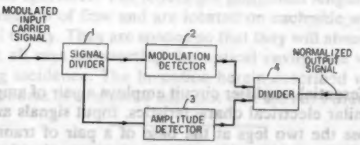
A channel combining circuit for homodyne receivers or other systems employing synchronous detection, which selects the output of either an in-phase detector or a quadrature phase detector. Each of two channels has an inverter circuit and two diodes making available at a common output terminal the most positive signal derived from either a positive or negative input signal from the detectors.

3,699,463

ERROR REDUCTION IN COMMUNICATION SYSTEMS

Julian Stone, Rumson, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Nov. 30, 1970, Ser. No. 93,769
Int. Cl. H03d 1/20
U.S. Cl. 329—145 7 Claims



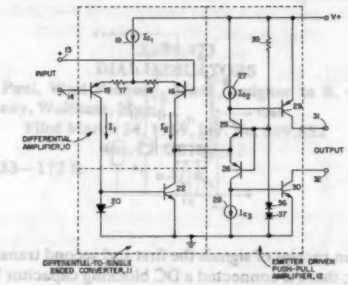
The output from a phase detector is a function of both the amplitude and phase of the input signals. Error, due to spurious amplitude modulation of the angular modulated carrier signal, is minimized by dividing the phase detector output signal by a reference signal whose instantaneous amplitude is proportional to the amplitudes of the phase detector input signals. A phase modulated, optical communication system is described. The principles of the invention are also applicable to amplitude and frequency modulated signal systems.

3,699,464

DEADBAND AMPLIFIER CIRCUIT

Don William Zobel, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 25, 1971, Ser. No. 118,844
Int. Cl. H03f 3/18, 3/68
U.S. Cl. 330—12 10 Claims



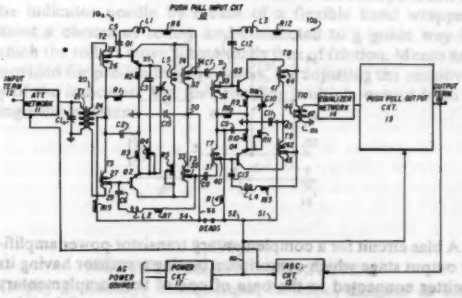
There is disclosed an amplifier with an adjustable deadband in which the common mode range is widened and in which the deadband is made easily adjustable by adjustment of the current sources coupled to the collectors of an emitter-driven push-pull output stage of the amplifier.

3,699,465

SELF-BALANCING PUSH PULL AMPLIFIER

John A. Pranke, Phoenix, Ariz., assignor to Theta-Com of California, Los Angeles, Calif.

Filed June 18, 1970, Ser. No. 47,227
Int. Cl. H03f 3/26
U.S. Cl. 330—15 8 Claims



A push pull amplifier including a circuit with an input stage and an output stage having a pair of transistors connected in push pull configuration and cross coupling networks providing negative feedback between the transistors of each pair to maintain the push pull stage in a balanced operating condition, and input and output networks for the circuit including impedance matching transformers and a push pull transformer, the networks being referenced to ground through the impedance matching transformers.

3,699,466

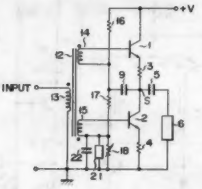
SINGLE ENDED PUSH-PULL AMPLIFIER

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Feb. 17, 1971, Ser. No. 115,991
Claims priority, application Japan, Feb. 26, 1970, 45/16554
Int. Cl. H03f
U.S. Cl. 330—15 10 Claims

In order to facilitate bias adjustment in a single ended push-pull amplifier comprising first and second transistors con-

nected in series between a power source and the ground, a circuit including a capacitor and load connected in series between the juncture of the first and second transistors and the ground, at least one circuit including of a plurality of resistors, one resistor being a variable one, connected in series between the power source and the ground so as to supply bias voltage to the first and second transistors, and an input transformer having first and second secondary windings so as to ac-



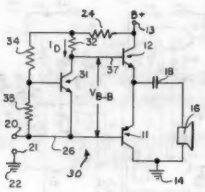
tuate upon receipt of signals the first and second transistors alternately; there is connected a DC blocking capacitor between the bias voltage supplying point included in the aforesaid resistor series circuit to the first transistor and the juncture of the first and second transistors, and voltage across the variable resistor included in the series circuit is supplied to the second transistor as bias voltage. The single variable resistor adjusts the proper operating condition.

3,699,467

BIAS CIRCUIT FOR A COMPLEMENTARY TRANSISTOR OUTPUT STAGE

Stephen Grout, Phoenix, Ariz., assignor to General Electric Company

Filed Dec. 29, 1969, Ser. No. 888,322
Int. Cl. H03f 3/18
U.S. Cl. 330—17 **6 Claims**



A bias circuit for a complementary transistor power amplifier output stage which comprises a biasing transistor having its emitter connected to the base of one of the complementary transistors and its collector connected to the base of the other of the complementary transistors. A collector resistor is in circuit with the collector of the biasing transistor and with a source of biasing potential. The input signal to the amplifier is coupled to the emitter of the biasing transistor and to the base of one of the complementary transistors. In one embodiment, a resistive divider biases the base of the biasing transistor, while in another embodiment, the base of the biasing transistor is directly connected to the source of biasing potential.

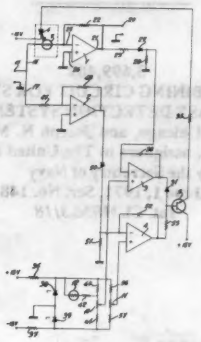
3,699,468

REGULATING AMPLIFIER

Hans-Lothar George Harmgardt, Oakville, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 8, 1971, Ser. No. 113,194
Int. Cl. H03g 3/30
U.S. Cl. 330—29 **6 Claims**

A regulated amplifier for supplying coded tone pulses from a communication line to the filters of a multifrequency decoding detector is made using directly coupled semiconductor elements for amplification and control. The gain of the amplifier is controlled by a light sensitive cadmium sulphide input series resistor illuminated by a gallium arsenide light emitting diode driven by the control circuit. An integrating amplifier stage is used to derive a control voltage from the output of the regulated amplifier, which voltage is modified by a temperature dependent reference voltage for compensating the tem-



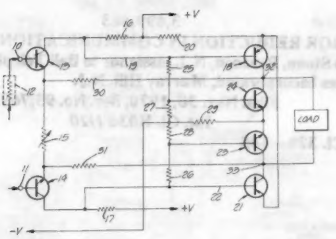
perature dependence of the light emitting diode. The control voltage is furnished to the stage that drives the light emitting diode through a coupling diode, so that a blocking voltage produced by an unregulated parallel channel of amplification-integration may be applied to the final control stage, to darken the light emitting diode and put the regulated amplifier in its minimum amplification condition when input signals are below the predetermined energy level.

3,699,469

DIFFERENTIAL AMPLIFIER

Shmuel Elazar, Ventura County, Calif., assignor to Statham Instrument, Inc., Oxnard, Calif.

Filed Jan. 2, 1970, Ser. No. 100
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **5 Claims**



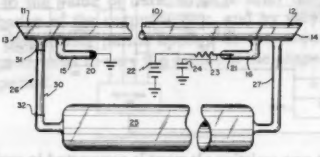
The differential amplifier circuit employs a pair of amplifier legs of similar electrical characteristics. Input signals are applied across the two legs at the base of a pair of transistors forming a first amplification stage. A further pair of output transistors are interrelated with the input amplification stage, and interconnecting the output transistors are constant current devices. Biasing voltage is applied via the constant current devices whereby common-mode signals are denied a path to the amplifier input and are effectively cancelled out to provide an output for the differential amplifier that is substantially purely related to the information signal. Another aspect is the provision of an input isolation circuit for eliminating common-mode return paths where the differential amplifier has internal voltage bias.

3,699,470

ELECTROSTATIC GAS BY-PASS FOR ION LASERS

Robert S. Witte, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed July 6, 1971, Ser. No. 159,812
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 9 Claims



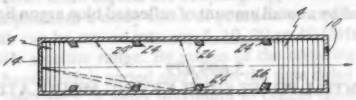
A gas ion laser having a gas reservoir and a by-pass, or connecting portion between the outer ends of the main envelope of the gas laser. Such a gas by-pass is necessary to equalize the pressure in the main discharge chamber during operation of the gas ion laser. Due to cataphoresis the gas pressure builds up at the anode, and for proper operation this pressure must be equalized. On the other hand, it is necessary to prevent the gas discharge from passing through the gas reservoir. This is accomplished by the present invention by inserting into the connecting portion of the gas reservoir between the main discharge and the reservoir an electrically conductive duct which provides a floating electric potential thereby to inhibit an electric discharge through the conductive duct.

3,699,471

STRAY RADIATION SUPPRESSION DEVICE

Richard C. Mulready, Jupiter, and Edward A. Pinsley, North Palm Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 20, 1971, Ser. No. 164,363
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 4 Claims



A series of fences are placed across the side walls of a flow channel forming the optical cavity of a gas dynamic laser which contains the gas dynamic laser flow therein and are positioned between end walls containing the laser beam mirrors and apertures. The fences are positioned lengthwise with the direction of flow and are located on each side wall of the optical cavity. They are spaced so that they will absorb and/or reflect all rays intersecting the optical cavity side walls at a grazing incidence. The invention herein described was made in the course of or under a contract with the Air Force.

3,699,472

ATHERMALLY STABLE LASER DEVICE

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed March 10, 1970, Ser. No. 18,253
Int. Cl. H01s 3/16
U.S. Cl. 331—94.5 10 Claims

Laser light generator containing a glass laser rod with a composition so chosen that the net thermal effects on the index of refraction are negated. The algebraic sum of the effects of the change in index of refraction caused by the temperature coefficient of the index of refraction, the coefficient of linear expansion, Poisson's ratio and the stress-optical effects, for light in one plane of polarization is chosen to be near zero, while remaining small but negative for the other polarization component.

3,699,473

DIAL INDICATORS

Igor L. Paul, West Peabody, Mass., assignor to B. C. Ames Company, Waltham, Mass.

Filed March 24, 1969, Ser. No. 809,552
Int. Cl. G01b 3/22
U.S. Cl. 33—172 R 4 Claims

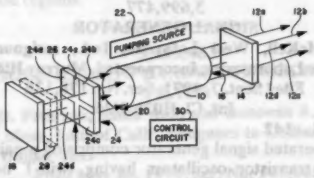
Low-friction dial indicators are provided wherein the linear motion of an indicator rod is converted to the rotary motion of the indicator needle by means of a flexible band wrapped about a cluster of rollers and connected to g guide way in which the rollers move substantially free of friction. Means are provided for pre-loading the rollers, for adjusting the sensitivity of the indicators and for providing multiple output from a single drive system.

3,699,474

MULTIPLE BEAM LASER SYSTEM

Murphy J. Landry, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 20, 1917, Ser. No. 91,478
Int. Cl. H01s 3/11
U.S. Cl. 331—94.5 7 Claims



An optical laser system in which the active lasing medium is simultaneously pumped over the entire volume of the lasing

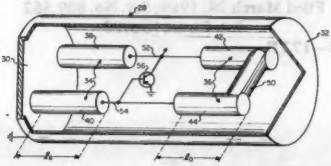
medium while providing various means for controllably generating giant pulses at different points in time by sequentially Q-switching of separate and distinct parallel volumes of the lasing medium.

3,699,475

DOUBLE-MODE TUNED MICROWAVE OSCILLATOR

Robert G. Rogers, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 16, 1971, Ser. No. 115,449
Int. Cl. H03b 5/18
U.S. Cl. 331—101 **15 Claims**



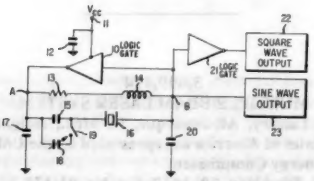
Two lengths of short circuited transmission lines that are defined by their odd and even-mode characteristics are connected to a microwave transistor to provide the external feedback network of a microwave oscillator. The feedback network may be obtained by using separate odd and even-mode transmission lines or, alternatively, the odd and even-mode transmission lines may be combined to form an extremely compact oscillator. Even when so combined, the positions of short circuits on the transmission line may be adjusted to permit frequency tuning and power peaking of the oscillator.

3,699,476

CRYSTAL CONTROLLED DIGITAL LOGIC GATE OSCILLATOR

Ronald Alfred Mancini, Palm Beach Gardens, Fla., assignor to RCA Corporation

Filed March 5, 1971, Ser. No. 121,307
Int. Cl. H03b 5/36
U.S. Cl. 331—116 R **9 Claims**



A high frequency crystal-controlled oscillator circuit which utilizes a digital logic gate in an amplifier mode of operation and produces sine or square wave output signals.

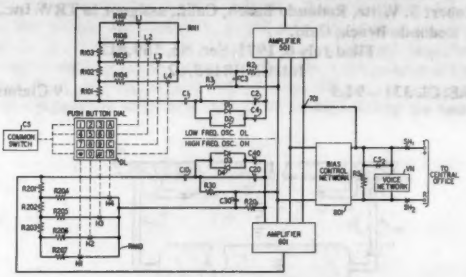
3,699,477

SIGNAL GENERATOR

Lynn J. McKell, West Lafayette, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 7, 1971, Ser. No. 178,126
Int. Cl. H03b 5/26
U.S. Cl. 331—142 **10 Claims**

A key operated signal generator comprising a pair of interconnected transistor oscillators having twin-T notch-filter feedback networks in which one resistance in each filter is variable and consists of a plurality of resistive elements arranged in a series parallel configuration. The series parallel configuration is such that when a single button of the key is actuated, at least two resistive elements are connected in series in each filter and when two buttons are actuated simultaneously, at least one resistive element is connected in series with two or more parallel resistive elements in at least one filter.

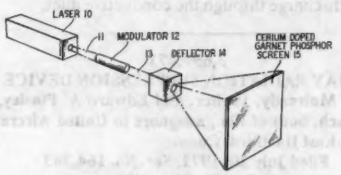


3,699,478

DISPLAY SYSTEM

Douglas A. Pinnow, Berkeley Heights, and Le Grand G. Van Uitert, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1969, Ser. No. 827,644
Int. Cl. H01s 3/00
U.S. Cl. 332—7.51 **8 Claims**



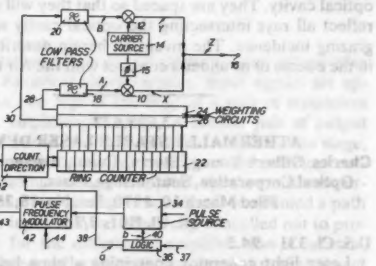
A black and white display is produced by projection using a scanning argon laser beam operating at 4,880 A and a phosphorescent screen of cerium-doped yttrium aluminum garnet which emits a broad range of frequencies centering about 5,500 A. The yellowish cast of the phosphor output is compensated by a small amount of reflected blue argon light.

3,699,479

DIFFERENTIAL PHASE SHIFT KEYING MODULATION SYSTEM

Raymond Thompson, Havant, and Ashley W. Guest, Waterlooville, both of England, assignors to The Plessey Company Limited, Ilford, England

Filed Dec. 7, 1970, Ser. No. 95,653
Claims priority, application Great Britain, Dec. 9, 1969, 59,911/69
Int. Cl. H04l 27/20
U.S. Cl. 332—16 R **8 Claims**



A differential phase shift keying modulating system is described, comprising two balanced modulators, one fed with

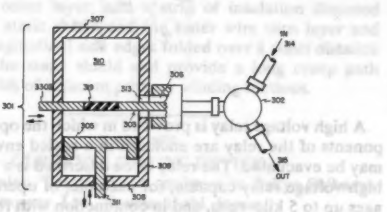
a carrier frequency and the other fed with the carrier frequency phase shifted by 90°. Modulating signals, respectively produced by a ring counter driving cosine and sine weighting circuits, are respectively fed to the two balanced modulators. Since the modulator signals have a sine/cosine relationship, the resultant output of the balanced modulators has a constant amplitude and a progressively increasing phase. Data is transmitted by causing the ring counter to count up or down, according to the value of data, so as to alter the direction of phase change of the output vector, and by varying the total number of stepping pulses applied to the counter during a given period, so as to vary the extent of the phase change during that period.

3,699,480

VARIABLE RF GROUP DELAY EQUALIZER

Martin Mueller, Chelmsford, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Dec. 15, 1969, Ser. No. 884,975
Int. Cl. H01p 7/06
U.S. Cl. 333—28 **7 Claims**



A tunable microwave phase equalizer primarily for use in satellite communication systems is disclosed comprising in combination a circulator and a two-knob tunable microwave cavity wherein one knob adjusts the resonant frequency, and the other knob adjusts the coupling. By means of the frequency adjustment a delay curve of practically constant shape and width can be moved into any 5, 10, 20 or 40 MHz band of the 6 GHz satellite range. By means of the coupling adjustment, the bandwidth is varied and with it the time delay curvature at the frequency of delay maximum to cancel third order intermodulations generally generated by the integral of the parabolic time delay curve. Second order intermodulation is eliminated by the frequency adjustment which changes the slope of the time delay curve and moves the curve away from the center frequency.

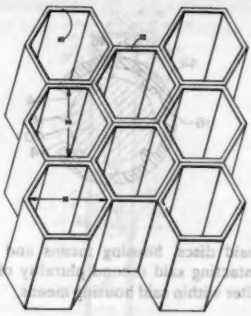
3,699,481

LOW VELOCITY HIGHLY ANISOTROPIC ELASTIC MATERIALS

Robert B. Thompson; Donald O. Thompson, both of Thousand Oaks; Edgar A. Kraut, Camarillo, and Teong C. Lim, Thousand Oaks, all of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed June 1, 1971, Ser. No. 148,766
Int. Cl. E04b 1/86; H03h 7/30
U.S. Cl. 333—30 R **2 Claims**

This invention discloses a class of materials having a cellular structure which is suitable to slow the movement or velocity of elastic waves therein. An example of this class of materials is a cellular phenolic honeycomb polymer in which an elastic wave has a delay time of 0.6 milliseconds per inch in contrast to a delay time of 0.005 milliseconds per inch obtained in quartz, the most widely used prior art material. By proper modification of the cellular structure parameters, that is, the thickness of the individual cell wall and the dimensions of the



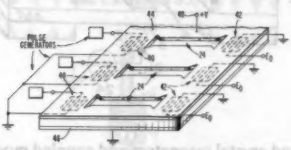
individual cell, a particular desired elastic wave velocity in a given direction can be obtained.

3,699,482

SURFACE WAVEGUIDING IN CERAMICS BY SELECTIVE POLING

Eric A. Ash, London, and Samuel C.-C. Tseng, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,179
Int. Cl. H03h 7/36, 9/30
U.S. Cl. 333—30 **10 Claims**



A surface waveguide structure and method of making same. A substrate material consisting either of a piezoelectric ceramic or ferroelectric crystal, is selectively poled by an electric field so as to form an elastic surface wave channel within the substrate structure. The electric field applied cross the substrate causes a polarization of the crystalline structure in those areas influenced by the electric field and has a negligible effect in those areas not exposed to the electric field. The free surface wave velocity is substantially increased in the polarized areas of the substrate and remains unchanged in the unpolarized regions. Poling of the substrate is accomplished by applying an electric field across a pair of electrodes which cover the upper and lower surfaces of the substrate except for a narrow region between the transmitting and receiving surface wave transducers.

The process for manufacturing the surface waveguide structure is applicable to both acoustic and optical surface waveguiding devices. Also, the polarization of the substrate may be selectively altered by subsequent application of electric fields across the body of the substrate to make switchable waveguide regions.

3,699,483

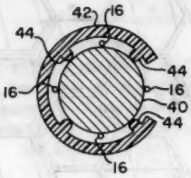
RUGGED, NARROW BANDWIDTH MECHANICAL FILTER

Wesley D. Peterson, Santa Ana, and Donovan A. Southworth, Costa Mesa, both of Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed May 26, 1971, Ser. No. 147,105
Int. Cl. H03h 7/30
U.S. Cl. 333—71 **3 Claims**

A mechanical filter includes a first plurality of active discs in spaced alignment, a second plurality of off-resonant discs

with each disc of said second plurality positioned intermediate a pair of discs of said first plurality, coupling rods selectively



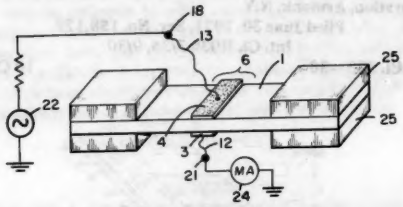
attached to said discs, housing means and support means physically contacting said second plurality of discs and supporting said filter within said housing means.

3,699,484

WIDTH EXTENSIONAL RESONATOR AND COUPLED MODE FILTER

Don A. Berlincourt, Chagrin Falls, Ohio, assignor to Vernitron Corporation, Bedford, Ohio

Filed June 24, 1970, Ser. No. 49,286
Int. Cl. H03h *9/16, 9/20*
U.S. Cl. 333—72 **12 Claims**



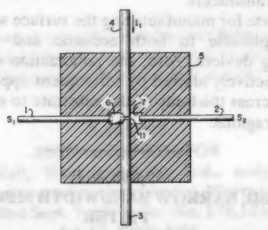
Ceramic and crystal resonators and coupled mode filters are disclosed, which operate in the width extensional mode. The operating frequency is determined primarily by the width of the plate.

3,699,485

LIQUID ARMATURE SWITCH

Michael Edward Lindenmeyer, North Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 15, 1971, Ser. No. 198,868
Int. Cl. H01h *29/02*
U.S. Cl. 335—49 **4 Claims**



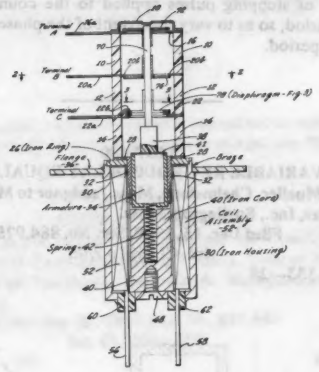
A liquid armature switch having two control electrodes mounted between two signal electrodes in a chamber is disclosed wherein the control electrodes are in constant contact with the armature and are positioned to restrain any movement of the armature which is not the result of the application of an electromagnetic switching force to the armature.

3,699,486

HIGH VOLTAGE MINIATURIZED RELAY

Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Los Angeles, Calif.

Filed Aug. 2, 1971, Ser. No. 168,009
Int. Cl. H01h *51/10*
U.S. Cl. 335—131 **8 Claims**



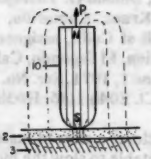
A high voltage relay is provided in which the operating components of the relay are enclosed in a sealed envelope which may be evacuated. The relay to be described is a miniaturized high voltage relay capable, for example, of operating at voltages up to 5 kilo-volts, and in conjunction with relatively high frequencies. The envelope of the relay is composed of ceramic, and the relay is capable of efficient operation in wide extremes of ambient temperatures. The relay includes a linearly movable contact which makes connection with a fixed common electrical terminal through a resilient diaphragm which is constructed to permit free linear reciprocal movement of the movable contact and yet maintain a positive electric current to the common terminal.

3,699,487

MAGNET FOR USE IN MAGNETIC THICKNESS GAUGES

Erich Steingroever, Bonn, Germany, assignor to Elektro-Physik Hans Nix and Dr. Ing. Steingroever, K.G., Koln, Germany

Filed April 13, 1971, Ser. No. 133,600
Claims priority, application Germany, Nov. 7, 1970, P 20 54 929.5
Int. Cl. H01f *7/02*
U.S. Cl. 335—302 **9 Claims**



A magnet for use in a magnetic gauge for measuring the thickness of a non-magnetic layer on a ferromagnetic base is made of magnetically anisotropic material.

3,699,488

DISTRIBUTION TRANSFORMER HAVING STATIC SHIELD

Ernest A. Goodman, and Joseph P. Handerhan, both of Pittsburgh, Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 28, 1972, Ser. No. 229,892
Int. Cl. H01f 15/04
U.S. Cl. 336—84 10 Claims

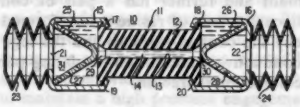
An electrical distribution transformer of the series-multiple type has a plurality of adjacent primary winding sections wound in radially superimposed helical layers of wire turns and also has a static shield for each winding section comprising a strip of aluminum-backed crepe paper disposed in overlaying relation to the outer wire turn layer and having both longitudinal edges folded over and flattened so that the aluminum is on the inside of the fold to provide minimum edge corona; a multi-layer insulation envelope wrapped around the aluminum-backed paper; a thin copper lead cold-welded to the aluminum and electrically connected to the finish wire turn of the outer layer; and a strip of insulation disposed between the static shield and the outer wire turn layer and having its longitudinal side edges folded over a short distance to position the static shield and provide a long creep path between shields of adjacent primary winding sections.

3,699,489

CURRENT LIMITING DEVICE

Yasutaka Imajyo, Tokyo, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Japan

Filed March 17, 1971, Ser. No. 125,304
Int. Cl. H01h 87/00
Claims priority, application Japan, Mar. 28, 1970, 45/25624; Mar. 28, 1970, 45/25626
U.S. Cl. 337—221 4 Claims



A current limiting device includes a casing containing a liquid metal sealed therein, the same being highly electrically conductive in its liquid state and highly non-conductive in its vaporized state. The casing is provided with a ceramic tube, a pair of tubular terminal caps sealingly mounted on the opposite ends of the ceramic tube and a pair of bellows secured to the ends of the terminal caps such that the inside of the bellows will communicate with the inside of the terminal caps. A buffer device is provided in the terminal caps for reducing the energy of the high vapor pressure of the vaporized liquid metal which may occur in the casing when a heavier fault current will be interrupted due to the vaporization of the liquid metal. Thus, any damage of the bellows which may result from the high vapor pressure of the vaporized liquid metal is effectively reduced.

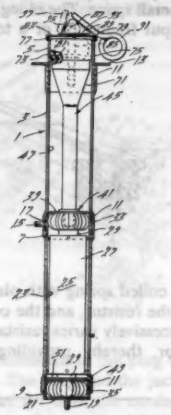
3,699,490

FUSE HOLDER

Herbert J. Macemon, Versailles, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Filed March 6, 1970, Ser. No. 17,260
Int. Cl. H01h 85/22, 85/58
U.S. Cl. 337—202 18 Claims

A fuse holder has a fluid-tight housing with external terminals that are internally connected to the fuse by annular coil springs. A fuse handling rod carries an expansible sleeve device at one end for connecting it to the fuse and a second



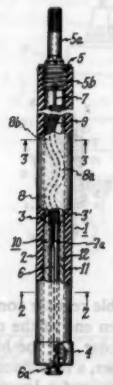
expansible sleeve device at the other end for sealing the end of the housing.

3,699,491

FUSE HAVING VIBRATION DAMPING MEANS FOR PROTECTING THE FUSE LINK THEREOF

Edward A. Vrabel, and Raymond Cuzzone, both of Pittsfield, Mass., assignors to General Electric Company

Filed Oct. 7, 1971, Ser. No. 187,450
Int. Cl. H01h 85/14
U.S. Cl. 337—246 9 Claims



A cartridge-type current limiting fuse is provided with a mechanical damping means for mounting a fusible link in the fuse in a manner such that the link will be protected from damage due to mechanical vibration of the equipment on which it is mounted during normal operating use.

3,699,492

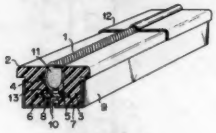
VARIABLE RESISTANCE DEVICE FOR A PORTAMENTO PERFORMANCE ON AN ELECTRONIC MUSICAL INSTRUMENT

Kenji Yoshihara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Nov. 9, 1971, Ser. No. 196,909
Claims priority, application Japan, Nov. 16, 1970, 45/113487; April 2, 1971, 46/24223; Nov. 25, 1970, 45/103460
Int. Cl. H01c 9/00
U.S. Cl. 338—69 10 Claims

A variable resistance device for a portamento performance on an electronic musical instrument wherein a conductive

coiled spring is held by a supporting member and an elongate resistor is so held by the supporting member as to face the coiled spring at a small space. The elongate resistor is used to determine the output frequency of a tone signal generator.



Depression of the coiled spring with player's finger causes it locally to contact the resistor, and the continuous shift of the player's finger successively varies resistance across the coiled spring and resistor, thereby providing a portamento performance.

3,699,493

LEVER-OPERATED VARIABLE RESISTOR

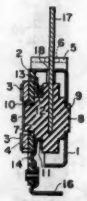
Shunzo Oka, Hirakata, and Akitoshi Miyashita, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 28, 1971, Ser. No. 184,369

Claims priority, application Japan, Sept. 30, 1970, 45/97559; Sept. 30, 1970, 45/97560; Oct. 13, 1970, 45/102083; Oct. 13, 1970, 45/102084; Oct. 13, 1970, 45/102085; Oct. 13, 1970, 45/102086; Oct. 13, 1970, 45/102087

Int. Cl. H01c *9/02*

U.S. Cl. 338—132 **9 Claims**



A lever-operated variable resistor comprising a case, a base plate provided at the open end of the case, a contact carrier interposed between the case and the base plate, a contactor fixed on the contact carrier, a resistance element provided on the case or the base plate and a lever provided on the side periphery of the contact carrier; in which a couple of supporting portions formed integrally with the sides of the contact carrier are fitted respectively in a couple of supporting holes formed opposite to each other in the base plate, the contactor is in contact with the resistance element, and the lever is projected through a slot formed on the side wall of the case.

3,699,494

GROUNDING CONNECTOR

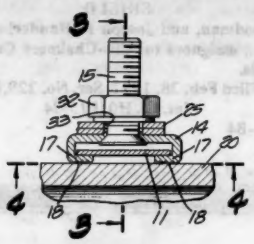
John T. Thompson, 244 Loring Street, Los Angeles, Calif., and George W. Gillemot, 2331 20th Street, Santa Monica, Calif.

Filed Oct. 15, 1970, Ser. No. 80,994

Int. Cl. H01r *3/06, 13/24*

U.S. Cl. 339—14 R **19 Claims**

A grounding assembly for use in completing a high strength solderless connection between conductive means and a grounding conductor supported in the earth, such as a pipe or stake. Either single or multiple solderless terminal units can be held captive adjustably along a single clamping band. The solderless terminal units can also be used alone or in multiple to provide assurance of a better and a higher capacity connection with the ground stake or pipe. These terminal units also



include tempered sharp edges in high pressure contact with both the ground wire and the ground stake.

3,699,495

ELECTRICAL CONNECTOR FOR VEHICLE INSTRUMENTS

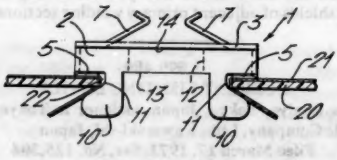
Terence Robert Raynor, London, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 1, 1971, Ser. No. 111,421

Claims priority, application Great Britain, Feb. 21, 1970, 8,453/70

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 C **1 Claim**



An electrical connector is disclosed and comprises a body part which is preferably formed as an extrusion and has a contact part secured thereto. The contact part has a pair of contact arms for engaging an electrical component such as a vehicle instrument and further has a pair of contact surfaces located adjacent a pair of resilient legs formed on the body part whereby the contact surfaces and the legs cooperate to engage a conductive track on an insulating panel and make electrical connection therewith.

3,699,496

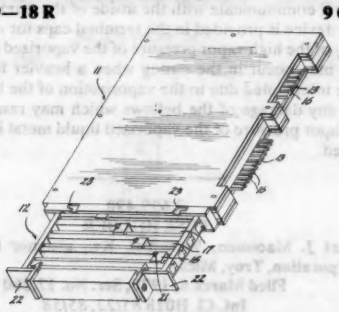
SWITCHING MATRIX

Thomas Howard Witcher, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed March 25, 1968, Ser. No. 715,934

Int. Cl. H01r *25/00*

U.S. Cl. 339—18 R **9 Claims**



A switching matrix includes a settable matrix adapted for insertion between input and output contact boards. Sliders of in-

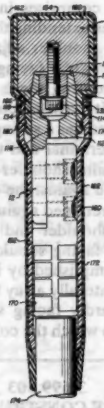
sulative material, carrying knife-edged cross contacts, are secured to separate guides in the settable matrix. The cross contacts are adapted to provide an electrical connection between two conductive paths, one associated with the input contact board and one associated with the output contact board.

3,699,497

TERMINAL CONNECTOR

James Joseph Cooper, Jr., and Gary Lee Schurter, both of St. Louis, Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,339
Int. Cl. H01r *13/52*
U.S. Cl. 339—60 R **7 Claims**



To provide a large contact area and rigid high pressure connection between a heavy power carrying terminal and a power distribution bus, capable of being thoroughly insulated with water-impervious material, a tapered or inverted frusto-conic socket is suitably machined or incised into the bus and a terminal having a similarly tapered shank is press-fitted into the socket. A clearance bore through the shank receives a bolt for connection through a receiver in the bus located beneath the conic socket. An arched washer may be used under the head of the bolt to maintain a high pressure engagement between the terminal shank and the bus during changing thermal or vibratory conditions. The entire connection area may then be jacketed with a double jacket, the jacket serving to insulate the bus and connection in a water-impervious, sealing fashion.

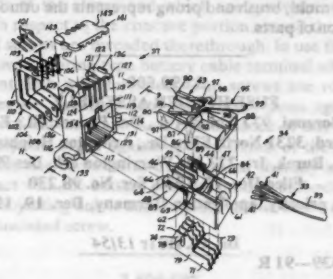
3,699,498

DEVICES FOR MAKING ELECTRICAL CONNECTIONS

Edwin C. Hardesty, Perry Hall, Md.; Charles L. Krumreich; Albert E. Mulbarger, Jr., both of Indianapolis, Ind., and Stephen W. Walden, Morral Township, Shelby County, Ind., assignors to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J. and Western Electric Company Incorporated, New York, N.Y.

Filed April 30, 1970, Ser. No. 33,211
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 M **37 Claims**

Identical miniature plugs are attached to both ends of a telephone cord. The plugs are mated with miniature jacks in the handset and in the base of a telephone. A plurality of stand-up, blade terminals are positioned in spaced troughs of a housing of the plug with each of the terminals having tangs that pierce the insulation of insulated tinsel conductors of the cord placed in the troughs and pressed into engagement with the tangs by associated ribs formed in a lid of the housing which is welded ultrasonically to the housing. The mating jack has a plurality of U-shaped stand-up, blade terminals with provisions similar to the plug for making electrical contact with conductors leading into the jack. One leg of each of the U-shaped terminals of the jack is caused to engage an associated one of the terminals in the plug when the plug is inserted into the jack. The plug and the jack have facilities for providing strain relief for both the cords and the individual conductors.

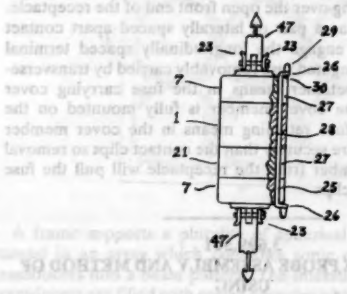


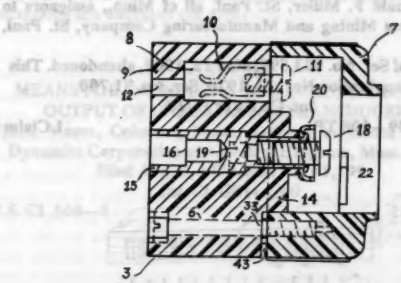
3,699,499

UNIVERSAL ELECTRIC CONNECTOR

Conan H. Spaderna, 404 Farmington Avenue, Hartford, Conn.

Filed March 8, 1971, Ser. No. 121,723
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **3 Claims**





This invention relates to an electric connector comprising two electrically mating bases, called body and cap. The improvement comprises that each base is being made with more than two like, peripherally unevenly spaced cavities for holding contacts, wherein these contacts are all interchangeable brushes within the connector body and all interchangeable prongs within the cap. This allows a three or four cavity connector to be used with a two pole set as well as with a three pole set of contacts, without permitting any mismating of

poles as would occur with even spacing. This mating guard may be still improved by a new locking bolt that aligns the bases before mating. After mating the bolt secures the bases against accidental separation. The proposed use of a single type base mold, brush and prong represents the utmost in standardization of parts.

3,699,500

FUSE HOLDER ASSEMBLY

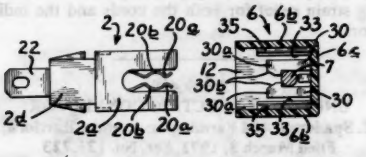
John J. Borzoni, 972 Third Ave., Des Plaines, Ill.; Edward A. Swichard, 3231 North Ellen Dr., Arlington Heights, Ill., and John A. Burek, Jr., 223 No. Warrington Rd., Des Plaines, Ill.

Filed Dec. 15, 1970, Ser. No. 98,230

Claims priority, application Germany, Dec. 19, 1969, P 19 63 648.7

Int. Cl. H01r *13/54*

U.S. Cl. 339—91 R **3 Claims**



A fuse holder assembly comprising a box-like receptacle and a box-like fuse carrying cover member or insulating hood slidably telescoping over the open front end of the receptacle. The receptacle has a pair of laterally spaced apart contact clips adapted to engage the longitudinally spaced terminal portions of an elongated fuse removably carried by transversely flexible fuse retainer means in the fuse carrying cover member when the cover member is fully mounted on the receptacle. The fuse retaining means in the cover member holds the fuse more securely than the contact clips so removal of the cover member from the receptacle will pull the fuse from the contact clips.

3,699,501

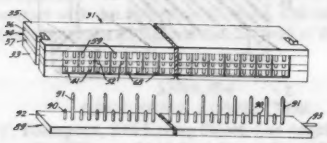
CONDUCTIVE PROBE ASSEMBLY AND METHOD OF USING

Dennis J. Enright, St. Paul; Richard D. Kahabka, Burnsville, and Donald F. Miller, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 823,598, May 12, 1969, abandoned. This application Nov. 23, 1970, Ser. No. 91,780

Int. Cl. H01r *11/18*

U.S. Cl. 339—108 TP **1 Claim**



A conductive probe assembly useful in testing and, in modified form, in protecting a communications cable containing modular splice assemblies wherein each module is multiperforate to provide access to each inner contact element.

3,699,502

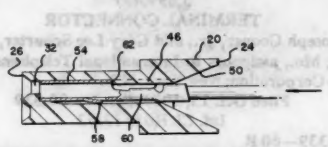
ELECTRICAL CONNECTOR HAVING IMPROVED CONTACT RETENTION MEANS

Clyde Thomas Carter, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 11, 1971, Ser. No. 105,208

Int. Cl. H01r *13/42, 23/10*

U.S. Cl. 339—176 M **4 Claims**



Electrical connector comprises insulating housing having contact receiving cavities extending therethrough. Each cavity has a rearwardly facing shoulder adjacent to the mating face of the housing and a forwardly facing shoulder adjacent to its rearward face of the housing these shoulders being on opposite sides of the cavity. An electrical contact terminal is located in each cavity and has a spring means thereon which is effective between the terminal and the side of the cavity on which the rearwardly facing shoulder is located so that the terminal is resiliently biased against the opposite side of the cavity. Terminal is thereby retained against forward movement by the rearwardly facing shoulder and against rearward movement by the forwardly facing shoulder. Removal of contact from the cavity is accomplished by inserting a thin tool into the contact, moving it laterally away from the side of the cavity on which the forwardly facing shoulder is located, and pulling the conductor to which the contact is secured.

3,699,503

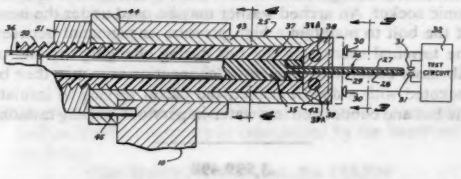
PROBE CONSTRUCTION

Gunther Schaaf, Fridley, and Nathan R. Smith, Minneapolis, both of Minn., assignors to Ramsey Engineering Company, St. Paul, Minn.

Filed March 2, 1971, Ser. No. 120,213

Int. Cl. H01r *13/50*

U.S. Cl. 339—176 P **15 Claims**



A test probe for use in machines for testing magnetic cores. The probe is clamped in chuck jaws which are used for making contact with the test circuit and which keep the total indicated run out of the probe within acceptable limits even when very small cores are being treated.

3,699,504

OPEN BARREL COAXIAL CABLE TERMINAL

John Henry Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

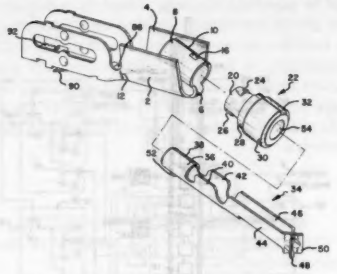
Filed Feb. 17, 1971, Ser. No. 116,056

Int. Cl. H01r *11/08*

U.S. Cl. 339—177 R **5 Claims**

Method and apparatus for providing a coaxial cable terminal, wherein, a sleeve of dielectric material supports a coaxial cable center conductor in electrically isolated relationship with respect to a conducting sleeve. The outer conducting shield of the coaxial cable is terminated to the conducting

sleeve and the center conductor of the cable is electrically connected to a terminal externally of both the conducting sleeve and the dielectric sleeve. Ears extending from the conducting sleeve are adapted for forming a crimped open barrel which encircles and retains the outer conducting shield electrically to the conducting sleeve.



3,699,505

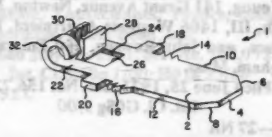
STAKED TAB TERMINAL

Peter Martin Bruner, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed March 11, 1971, Ser. No. 123,318

Int. Cl. H01r 9/08

U.S. Cl. 339—221 R **5 Claims**



An electrical terminal in the form of a tab for mounting within a substrate and provided with serrations preventing removal of the terminal from the substrate. The terminal is further provided with a hilt for limiting insertion of the terminal. The shank of the terminal is provided with a wire barrel and an insulation support, with an aperture defined generally centrally of the terminal longitudinal axis for receiving an insertion tool. The aperture together with the hilt cooperate to align and retain the terminal in registration on the insertion tool.

3,699,506

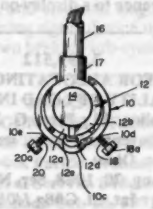
CLAMP FOR VEHICLE STORAGE BATTERY SPRING TYPE CABLE TERMINAL

Jesse R. Hollins, One Chester Drive, Great Neck, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,352

Int. Cl. H01r 11/26

U.S. Cl. 339—237 **10 Claims**



A clamp for securely locking a spring type battery cable terminal to a battery post. The clamp is bail shaped and stiff and has two ends which are turned inwardly. A concave section is located on a portion of the clamp symmetrically between the ends thereof to accommodate the manipulating tabs of the cable terminal. Two tapped openings approximately opposed to the ends of the clamp and which are symmetrically positioned with respect to the concave portion extend through the clamp and screws are threaded therethrough. In use the clamp is placed over a spring type battery cable terminal which is in engagement with a battery post. The screws are rotated in their respective openings until they tightly press against the spring legs of the terminal. As a consequence of this the ends of the clamp are urged against spaced points of the terminal remote from the screws and the terminal thereby is held in tight contact with the battery post. In another embodiment an inwardly projecting nub is used in place of one of the openings and the associated screw.

3,699,507

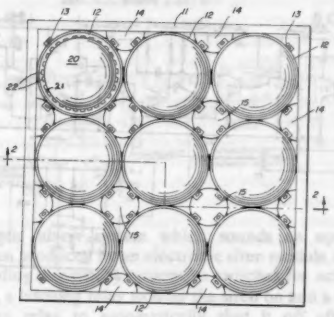
BAFFLE STRUCTURE FOR UNDERWATER TRANSDUCER ARRAY

Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.

Filed Aug. 5, 1970, Ser. No. 61,198

Int. Cl. G01v 1/00

U.S. Cl. 340—8 S **8 Claims**



A frame supports a plurality of spherical transducers arranged in an array which combines sonic energy from the transducers into a beam pattern. The interstices between the transducers are filled with sealed capsules which increase stiffness and impedance to the passage of sound without greatly increasing the weight of the array.

3,699,508

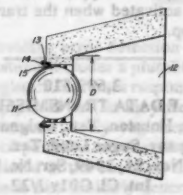
MEANS FOR INCREASING THE ACOUSTIC POWER OUTPUT OF UNDERWATER TRANSDUCERS

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Aug. 5, 1970, Ser. No. 61,199

Int. Cl. G01v 1/00

U.S. Cl. 340—8 **12 Claims**



An underwater transducer is force limited and mounted in a

baffle structure which presents less than a 100 percent rho-c loading. By so reducing the radiation resistance of the acoustic impedance of the transmission medium, the acoustic output from the transducer can be increased.

3,699,509

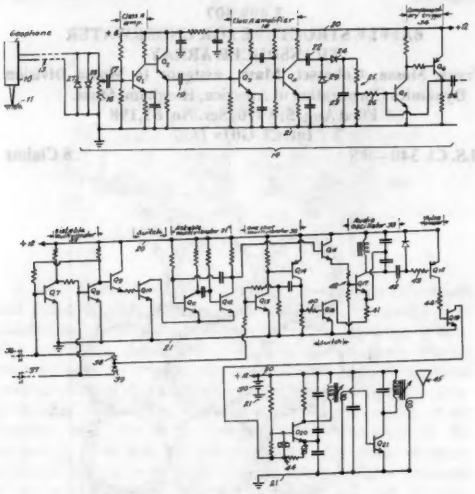
SEISMIC SYSTEM FOR REAL-TIME REPORTING

Kenneth A. Hirschberg, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 21, 1969, Ser. No. 868,142The portion of the term of this patent subsequent to Nov. 25, 1986, has been disclaimed.

Int. Cl. G01v *1/16*

U.S. Cl. 340—15 5 Claims



A seismic system for real-time directional reporting for providing radio signals indicating the direction and location of traffic along a path wherein two geophones positioned adjacent said path and spaced from each other are each connected to separate channels each of which includes amplifier means coupled to an integrator capacitor which in turn is coupled to a trigger circuit whereby the signals developed by the geophone are converted to a sharp trigger pulse. The output of each channel is coupled through a diode to a one-shot multivibrator whose output is coupled to a transistor switch in series with the emitter circuit of a transistor audio frequency oscillator and power supply whereby when a trigger pulse from either channel is applied to the one-shot multivibrator the audio frequency oscillator is activated for the period of the one-shot multivibrator. The trigger pulses of the channels are also connected to the inputs of a flip-flop which is set by one channel and reset by the other. The output of the flip-flop is coupled to a transistor switch in series with an astable multivibrator and the power supply whereby said astable multivibrator may be activated when the transistor switch is enabled by the flip-flop.

3,699,510

BOREHOLE DATA TRANSMISSION SYSTEM

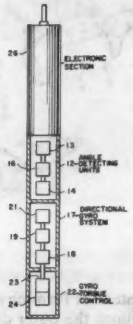
James M. Lindsey, Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 21, 1969, Ser. No. 879,011

Int. Cl. G01v *1/22*

U.S. Cl. 340—18 CM 35 Claims

The particular embodiment described herein as illustrative of one form of the invention utilizes an instrument system for detecting the angular position and directional orientation of a housing within a wellbore and for generating signals indicative of such information. These signals are stored in binary form



and then coded for transmission to the surface over a conductor which also carries the power supply for the system. At the surface the signals are decoded to provide data indicative of downhole information.

3,699,511

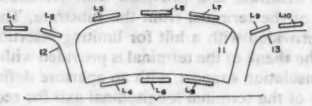
DISPLAY RESEARCH COLLISION WARNING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Renwick E. Curry, 53 Tower Road, Hingham, Mass.; Laurence R. Young, 141 Grant Avenue, Newton, Mass.; Thomas Basil Smith, III, 1406 Westgate Apartment, M. I. T., Cambridge, Mass., and John Rawson, 360 Emerson Road, Hatfield, Hingham, Mass.

Filed June 25, 1971, Ser. No. 156,724

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 NA 6 Claims



A head-up display for a PWI system is disclosed. The display consists of a plurality of strips of an electroluminescent tape secured above and below the windshield and above side windows of a cockpit. The strips are associated with elevation range and azimuth range sectors which are viewable by the pilot through the windshield or windows, and are located in the directions of these sectors. When a target is detected in any of the sectors by a corresponding detector the strip or strips associated with the particular sector are illuminated. The pilot's peripheral vision is sufficient to notice their illumination thereby enabling him to directly view the particular sector without reference to a display on the instrument panel.

3,699,512

APPARATUS FOR ALLOCATING AND TIMING A PLURALITY OF LOAD INTERVALS

Frank W. Hill, Moline, Ill.; Peter G. Bartlett, and Larry K. Clark, both of Davenport, Iowa, assignors to E. W. Bliss Company, Canton, Ohio

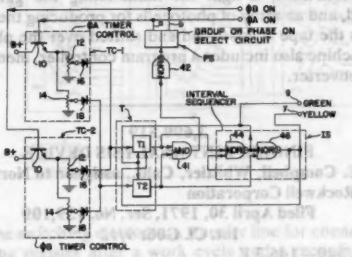
Filed Aug. 20, 1968, Ser. No. 812,480

Int. Cl. G08g *1/085*

U.S. Cl. 340—41 20 Claims

Apparatus is disclosed herein for sequentially allocating and timing a plurality of intervals during which different loads are energized within each of a plurality of groups of such intervals.

This apparatus includes a common timer circuit associated with all of the groups and having a first timing means for timing a first interval and then providing a first interval termination signal, and second timing means for timing a second interval and then providing a second interval termination signal. The apparatus also includes a common interval sequencer circuit associated with all of the groups and having first actuator means for actuating the second timing means and second actuator means for actuating the first timing means.



3,699,513

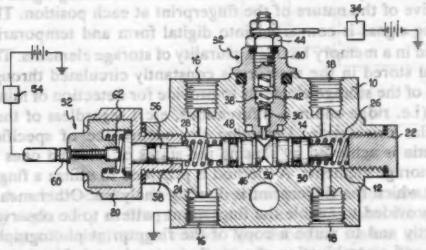
WARNING DEVICE FOR A SPLIT FLUID PRESSURE BRAKING SYSTEM

Philippe Nicodeme, Louveciennes, France, assignor to The Bendix Corporation, South Bend, Ind.

Filed July 15, 1971, Ser. No. 162,772

Int. Cl. B60q *1/00*; H01b *35/38*

U.S. Cl. 340—52 C **2 Claims**



A warning device for a split fluid pressure braking system, comprising a first single switch controlling the activation of stop lights of a vehicle upon build-up of pressure in at least one of the sub-system, and a second single switch controlling the activation of a warning signal device upon a differential of pressure between the two braking sub-systems.

3,699,514

AUTOMATIC CONTROL OF HEADLIGHTS, TAILLIGHTS, AND WARNING FLASHER LIGHTS

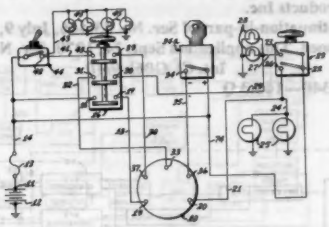
Walter R. Stevens, 2294-A Pacific Avenue, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 845,131, July 28, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 189,963

Int. Cl. B60q *1/04, 1/52*

U.S. Cl. 340—60 **2 Claims**

An automatic switch actuated from engine oil pressure which when turned on, will turn on the headlights only after the engine has been started, and will turn them off after the engine has stopped; and should the engine stall, warning flasher lights will turn on automatically, and will continue to operate until the engine is restarted and the headlights turn on.



3,699,515

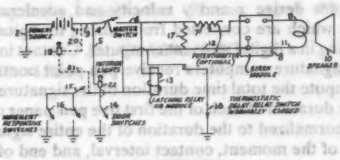
MOVEMENT RESPONSIVE ALARM SYSTEM FOR A VEHICLE

Howard James Barnett, 4433 North Stanton, Apt. 412, El Paso, Tex.

Filed Jan. 4, 1971, Ser. No. 103,698

Int. Cl. B60r *25/10*

U.S. Cl. 340—65 **5 Claims**



An automatic alarm system which sounds an upward screaming siren produced by an electronic siren module and a speaker including movement responsive switches for activating the alarm, a latching relay to hold the siren on and a thermostatic delay relay to automatically shut it off after a predetermined length of time and then reset it.

3,699,516

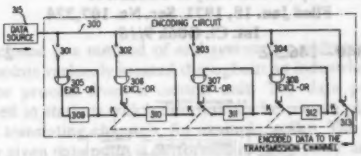
FORWARD-ACTING ERROR CONTROL SYSTEM

Paul Mecklenburg, Fort Lee, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 18, 1971, Ser. No. 107,316

Int. Cl. G06f *11/12*

U.S. Cl. 340—146.1 AQ **18 Claims**

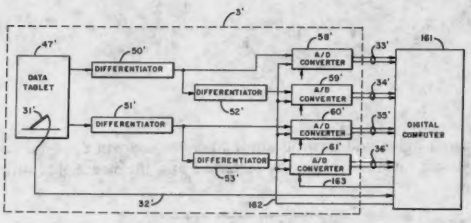


Apparatus for providing error detection and correction in data transmission systems includes a plurality of exclusive-OR circuits and delay registers. Switches responsive to control circuitry selectively apply data bits, as they are generated, to the exclusive-OR circuits and delay registers which, in turn, generate a number of partially completed check bits. As the check bits are completed in the encoder, they are inserted in the data stream. Check bits similarly generated in a decoder are, compared with the received check bits and the results of this comparison used to locate errors in the data stream. Error correction circuitry then corrects the indicated errors.

3,699,517
HANDWRITING AUTHENTICATION TECHNIQUE

James W. Dyche, Cupertino, Calif., assignor to Sylvania Electric Products Inc.

Continuation-in-part of Ser. No. 53,446, July 9, 1970, abandoned. This application Sept. 24, 1970, Ser. No. 75,135
Int. Cl. G06k 9/10
U.S. Cl. 340—146.3 Q 19 Claims

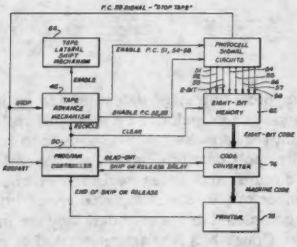


Apparatus and method for measuring and computing velocity and acceleration of a pen point and the pen-paper contacts during writing of a signature and comparing derived data with reference data obtained from several prior signatures to determine whether the real time and reference signatures were made by the same person. The variations $x(t)$ and $y(t)$ of pen point coordinates with time and pen-paper contact intervals are obtained from a graphic tablet. Differentiator circuit means derive x and y velocity and acceleration components which are converted from analog to digital form for processing in a digital moment computer. Contact interval and end of signature computers receive pen point contact signals and compute the total time duration of the signature as well as the time duration of each of the first five pen-paper contact intervals normalized to the duration of the entire signature. The outputs of the moment, contact interval, and end of signature computers are sixteen components of a real time signature vector. A reference signature vector comprised of the mean values of sixteen similar components is predetermined from a plurality of prior true signatures, the deviation of each of those mean component values from the corresponding component value in a real time signature is compared with a variation limit value for that component to determine a correlation, and an authentication decision is made based on a minimum number of such correlations.

3,699,518
METHOD AND MACHINE FOR READING HANDWRITTEN CURSIVE CHARACTERS

Maurice Leighton Greenough, and Milton L. Kuder, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of Commerce

Filed Jan. 18, 1971, Ser. No. 107,324
Int. Cl. G06k 9/18
U.S. Cl. 340—146.3 Z 2 Claims

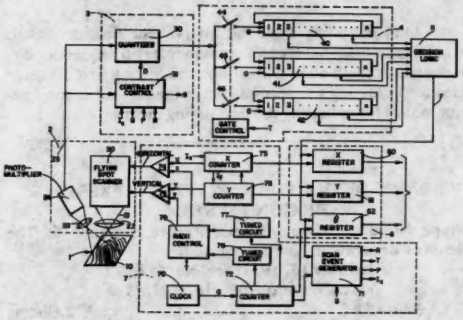


A machine for reading alphanumeric characters handwritten within preprinted guides. The guides position eight strokes (leading strokes, body strokes, head strokes, etc.) used in forming cursive characters. The machine scans the guides in sequence, producing for each guide an eight-bit code corresponding to the strokes formed in it. The eight-bit codes are converted to standard machine codes. In a detailed embodiment, the guides are serially printed on a paper tape and the machine includes a tape advance mechanism, a tape lateral shift mechanism, a light for illuminating the guide being scanned, and an array of photocells for producing the eight-bit code as the tape is advanced and shifted over the photocells. The machine also includes a program controller, memory, and code converter.

3,699,519
FINGERPRINT ANALYSIS DEVICE

Mark E. Campbell, Whittier, Calif., assignor to North American Rockwell Corporation

Filed April 30, 1971, Ser. No. 139,109
Int. Cl. G06r 9/12
U.S. Cl. 340—146.3 E 10 Claims



A fingerprint is observed, a small portion at a time, using a flying spot scanner, whose spot travels along a predetermined path at each position to provide an electrical analog signal indicative of the nature of the fingerprint at each position. The analog signal is converted into digital form and temporarily stored in a memory having a plurality of storage elements. The signal stored in the memory is constantly circulated through each of the storage elements to provide for detection of minutiae (i.e. ridge endings, bifurcations, etc.) regardless of their angular orientation. Detecting the occurrence of specified minutia is achieved by sensing the states of selected ones of the storage elements. A method is provided to utilize a finger from which the fingerprint is directly analyzed. Other means are provided to enable the fingerprint pattern to be observed directly and to make a copy of the fingerprint photographically and a combination of optical-electronic and electrostatic methods.

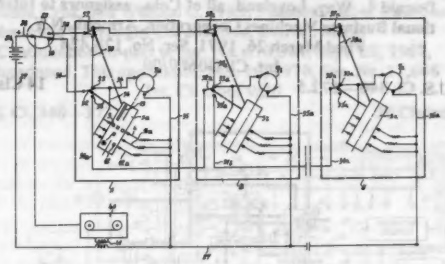
3,699,520
METHOD FOR REMOTE READING SUCCESSIVE DATA OF VARIOUS APPARATUSES AND DEVICE FOR OPERATING THE SAME

Roland Francois Edouard Frayssinoux, Paris, France, assignor to Compagnie Des Comptenes, Paris, France

Filed April 10, 1969, Ser. No. 815,169
Claims priority, application France, April 19, 1968, 68148750
Int. Cl. H04q 9/00
U.S. Cl. 340—150 23 Claims

Apparatus for remote reading successive data of various devices wherein a common line connected to a recorder joins the data sources of sub-units to successively transfer data to the common line, a signal being transmitted at the end of each reading to switch to the next sub-unit so that all the data are successively recorded.

Each sub-unit comprises registers with means to register the data, a motor for driving a member analyzing the registering means, both of them being connected to a common line and



driving the switching elements, a transfer line for connecting a succeeding register after a work cycle and a recorder being connected to the common line to record the successive data.

3,699,521

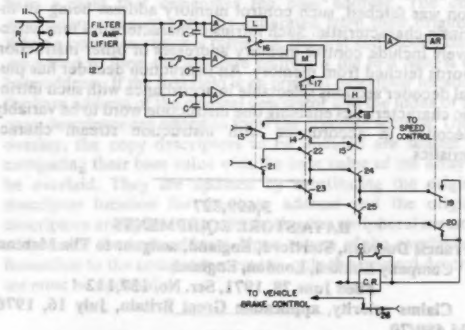
DECODING SYSTEM HAVING PLURAL FREQUENCY CHANNELS

J. Donald Hughson, Macedon, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,209

Int. Cl. A04q *1/45*

U.S. Cl. 340—171 A **5 Claims**



A vehicle control decoding system has been provided having a plurality of filters tuned to detect code rates for selectively actuating output relays. The decoding system includes first checking means controlled by the outputs of the filters for delivering an output in accordance with only the most restrictive code rate output of the filters and a second checking means governed by the output of the first checking means and contacts of the relays for manifesting that only one of the relays is energized at a time.

3,699,522

LOCOMOTIVE RADIO CONTROL SYSTEM WITH ADDRESS AND COMMAND SIGNALS

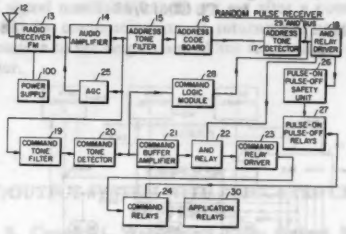
Robert B. Haner, Jr., Scottsville, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 20, 1966, Ser. No. 580,825

Int. Cl. H04q *11/04*

U.S. Cl. 340—171 R **17 Claims**

A communication system for controlling a remotely located device including a transmitter and receiver for sending and receiving address and command instruction signals with such device. The communication system further includes circuitry for detecting and determining the propriety of the address and command instruction signals. Gating circuitry is provided to conduct proper address and command instruction signals and additional circuitry is provided to produce a predetermined



command instruction after improper instruction signals have been continuously received for a predetermined interval of time.

3,699,523

METHOD AND APPARATUS FOR ADDRESSING DIFFERENT DATA POINTS FROM A CENTRAL STATION

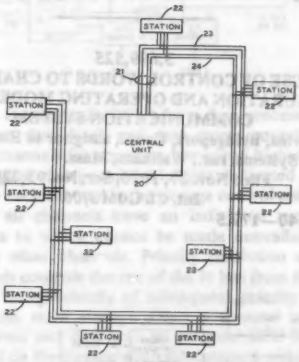
Guy Percher, Fresnes, France, assignor to Societe D'Instrumentation Schlumberger, Paris, France

Filed April 28, 1970, Ser. No. 32,686

Claims priority, application France, April 29, 1969, 6913553

Int. Cl. G08c *19/30*

U.S. Cl. 340—172.5 **14 Claims**



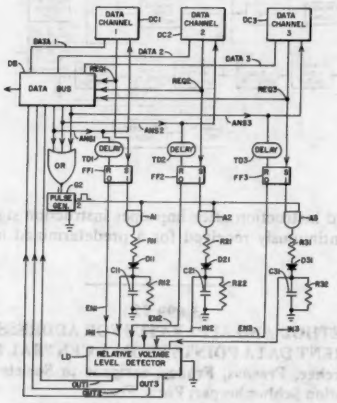
Disclosed is a method of and system for addressing plural data points variously located throughout an industrial installation or process from a central unit. The data points are grouped in stations which discriminate between a plurality of signal translating channels, for example, seven. The selection of any given data point is performed in two phases: addressing or selecting a station by transmitting from the central unit a combination of, for example, four channel signals selected from the exemplary seven channels, followed by addressing or selecting the given point by transmitting a combination of a lesser number, for example, three channel signals also selected from the exemplary seven channels. The data from the addressed point may be transmitted to the central unit either in digital form or as a frequency-modulated signal and/or the addressed point may serve as a control for a process. Both the central unit and the data points may be transceivers and communications therebetween may be transmitted by various suitable media.

3,699,524

ADAPTIVE DATA PRIORITY GENERATOR

Gayle R. Norberg, Minneapolis, Minn., assignor to Control Data Corporation, South Minneapolis, Minn.

Filed Aug. 10, 1970, Ser. No. 62,413
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 18 Claims



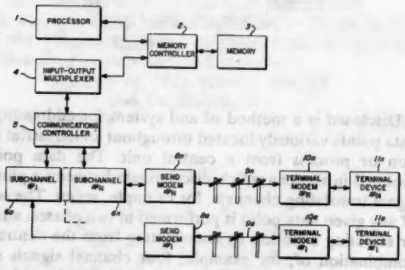
The invention comprises apparatus for assigning priority among several data channels being multiplexed into one data bus. Priority is based partly on recent usage history, and is increased for those channels having frequent recent use. Additionally, those channels which have requested, but have not received service are given continually increasing priority until service is granted.

3,699,525

USE OF CONTROL WORDS TO CHANGE CONFIGURATION AND OPERATING MODE OF A DATA COMMUNICATION SYSTEM

Aldis Klavins, Bridgeport, Conn., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Nov. 27, 1970, Ser. No. 93,229
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 11 Claims



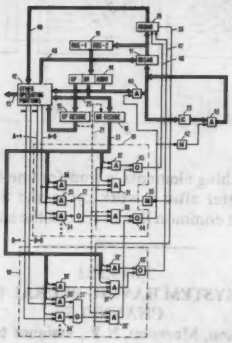
A data communication system comprising a processor, a memory, a communications controller and a plurality of terminal devices utilizes control words to select the configuration and to select the operating mode of the communication system. This system uses peripheral control words stored in memory to select the number of bits in message characters which may be used in the data communication system, to select the baud rate of the message which is received and to select a synchronous or asynchronous mode of transmission.

3,699,526

PROGRAM SELECTION BASED UPON INTRINSIC CHARACTERISTICS OF AN INSTRUCTION STREAM

James L. Iskiyan; James M. Waddell, both of Boulder, and Donald L. Way, Loveland, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 26, 1971, Ser. No. 128,424
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 14 Claims



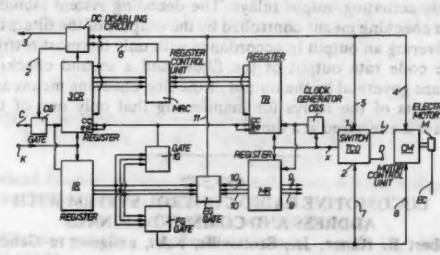
A programmable machine selects from among a plurality of branches on condition based upon intrinsic characteristics of the instruction stream in the machine. In a preferred form of the invention, an explicitly addressed machine selects from among a plurality of sets of branches on condition based upon the control memory address from which the branch instruction was fetched, such control memory address being an intrinsic characteristic. Such intrinsic characteristics may selectively include control memory addresses of other instruction words fetched from memory. An instruction decoder has plural decoder sections selectable in accordance with such intrinsic characteristics enabling one instruction word to be variably decoded in accordance with instruction stream characteristics.

3,699,527

DATA STORE EQUIPMENTS

Francis Duerden, Stortford, England, assignor to The Marconi Company Limited, London, England

Filed June 28, 1971, Ser. No. 157,112
Claims priority, application Great Britain, July 16, 1970, 34,480/70
Int. Cl. G11b 13/00; G06f 3/06
U.S. Cl. 340—172.5 13 Claims



Stored data signals, identified by label signals recorded a little in advance of the data signals, are searched for at high tape speed and played off at low tape speed, identification of the label signals automatically producing the tape speed change and setting the equipment to play off the data signals. A terminating signal recorded after the data signals stops the tape and terminates the sequence. Additional apparatus facilitates the recording of data and label signals.

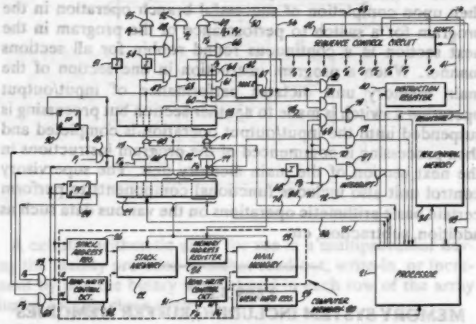
3,699,528
ADDRESS MANIPULATION CIRCUITRY FOR A DIGITAL COMPUTER

Carl B. Carlson, Santa Barbara; William M. McKeeman, Santa Cruz, and William C. Price, Pasadena, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 670,304, Sept. 25, 1967, abandoned. This application Feb. 16, 1970, Ser. No. 11,646

Int. Cl. G06f 9/20

U.S. Cl. 340—172.5 **39 Claims**



The overlay of information from the computer memory to a peripheral memory and its return to the computer memory are facilitated by a unique format for original and copy descriptors. The copy descriptors have a first field that designates either a base address or the location of its original, and a second field that designates an index. The original descriptors have a field that designates the base address. The copy descriptors are automatically generated from their originals. When a copy descriptor is retrieved, the first and second fields are added to form the absolute address if the first field is the base address. If the first field is an original descriptor location, the base address of the original descriptor and the index of the copy descriptor are added to form the absolute address. Upon overlay, the copy descriptors to be updated are sensed by comparing their base value with the base value of the array to be overlaid. They are updated by substituting the original descriptor location for the base address and the original descriptors are updated by substituting the peripheral memory address for the base address. Upon return of the overlaid information to the computer memory, only the original descriptor must be updated.

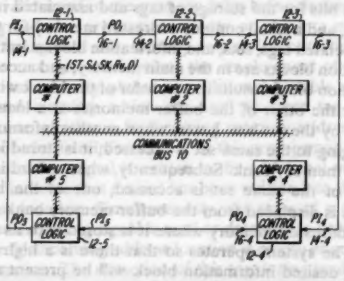
3,699,529
COMMUNICATION AMONG COMPUTERS

Billy Wesley Beyers, Greenfield, and Larry Lee Roy Tretter, Indianapolis, both of Ind., assignors to RCA Corporation

Filed Jan. 7, 1971, Ser. No. 104,626

Int. Cl. G06f 15/16; G05b 23/02

U.S. Cl. 340—172.5 **3 Claims**



Multiple computer system in which a control signal manifestation is circulated by a single control line from one computer to the next to indicate that the computer receiving the control signal manifestation may have available to it for communication with another computer a common communications channel. If, upon receipt of a control signal manifestation, a computer desires to transmit via the channel, it "captures" the control signal manifestation. If not, or after a computer has completed its communication, it returns the control signal manifestation to the single control line for passage to the next computer.

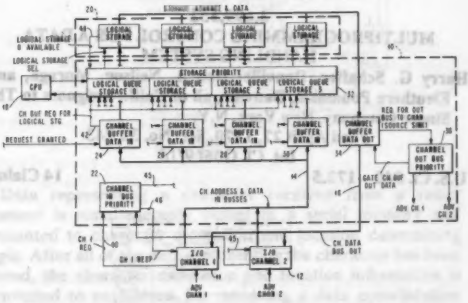
3,699,530
INPUT/OUTPUT SYSTEM WITH DEDICATED CHANNEL BUFFERING

Robert S. Capowski, Wappingers Falls; Robert M. Unterberger, Poughkeepsie, both of N.Y., and Larry R. Horsman, Louisville, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,577

Int. Cl. G06f 9/18

U.S. Cl. 340—172.5 **9 Claims**



A storage control unit (SCU) for a data processing system which buffers data fetch and data store requests from input/output channels for access to low-speed high-capacity interleaved logical storage units. Multiple dedicated buffers are provided for each channel in the storage control unit (SCU) to insure that all channels have an individual receptacle to transfer data to which cannot be made unavailable due to transfers by other channels. Priority resolution of requests from channels controls the use of the in bus from the channel to the SCU independently of subsequent priority resolution for use of the main storage. Once a channel transfers its storage address and data into its assigned SCU buffer, that buffer, based on the storage address contained within it, enters storage priority for the particular logical storage unit desired. In this manner, the single queue of channel requests is rearranged into four independent request queues based on logical storage addresses.

3,699,531
DIGITAL DATA SELECTION AND DISPLAY SYSTEM

Richard F. Heimann, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

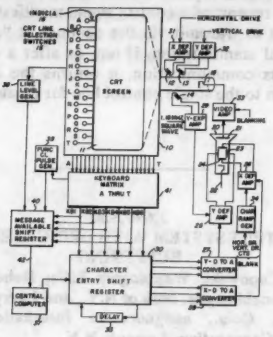
Filed March 13, 1970, Ser. No. 19,371

Int. Cl. G06f 3/14

U.S. Cl. 340—172.5 **17 Claims**

A real-time communications system in which a dynamic memory recirculates character address information for an entire frame of information for display in a line raster on a cathode ray tube and in which a plurality of selection switches

aligned with the individual lines of the raster permit an operator to select new frames of character information from a central memory for display and recirculation in accordance with the character information contained in the individual line selected.

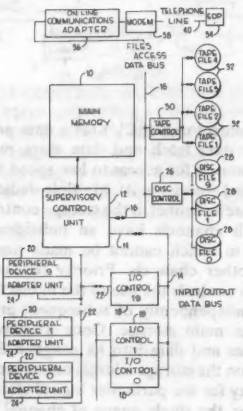


3,699,532

MULTIPROGRAMMING CONTROL FOR A DATA HANDLING SYSTEM

Harry G. Schaffer, Danville; Dan A. Neilson, Moraga, and Eleuthere Poumakis, Danville, all of Calif., assignors to The Singer Company, New York, N.Y.

Filed April 27, 1970, Ser. No. 32,243
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 14 Claims



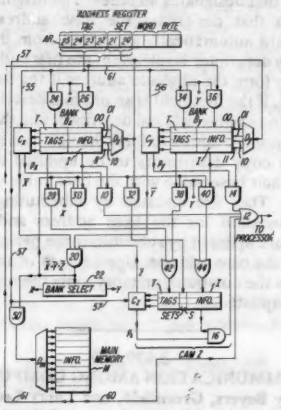
A data handling system including a plurality of groups of data originating and/or receiving devices operable asynchronously and independently with respect to each other, each group of such devices being coupled with an associated data transmission controller by means of a common data channel for buffering one unit (character) of data and providing certain basic data transmission controls for transmission of a character between an associated device and a common input/output data channel extending between the controllers and a supervisory control unit which is coupled with a main memory unit and a second data transmission channel. The second data transmission channel provides for transmission of characters between the supervisory control unit, the main memory unit and a data bank comprising a plurality of data storage or secondary data handling devices. The supervisory control unit provides the necessary elementary functional components to handle and control transmission of data between the data input/output devices and, the main memory and the data bank. The main memory unit is partitioned into a plurality of a section by means of adjustable hardware connected at each data transmission controller so as to permit only the data originating/receiving devices associated with it to communicate with an associated particular partitioned section of memory and an additional section of the memory is provided that is accessible to all partitions of the main memory unit. The supervisory control unit provides for a program stored in each particular section of the main memory unit to be executed for a predetermined period of time and then upon completion of successful branch operation in the program for a switch to performance of the program in the next section in a continuous round robbin for all sections manner. When a program instruction in one section of the main memory unit dictates performance of input/output operation a switch is made to another section but processing is suspended until the input/output operation is completed and then processing is commenced of the program instructions in the next section of the main memory unit. The supervisory control unit also includes functional components to perform certain basic arithmetic operations on the various data such as addition, subtraction, etc.

3,699,533

MEMORY SYSTEM INCLUDING BUFFER MEMORIES

Gregory Michael Hunter, Princeton, N.J., assignor to RCA Corporation

Filed Oct. 29, 1970, Ser. No. 85,190
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 8 Claims

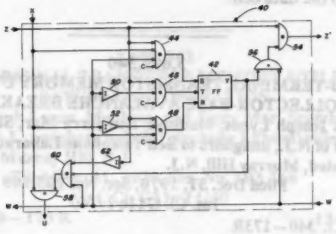


A memory system is disclosed which includes a large main memory having information block storage locations addressable by an address consisting of set and tag bits, two buffer memory banks each having storage locations addressable by the set bits for the storage of tags and associated information blocks, and a small content-addressed memory for the storage of associated tags, sets, and information blocks. Initially, all information blocks are in the main memory, and accessing an information block results in a transfer of the block with its tag to one or the other of the buffer memories at a location determined by the set bits. Later, when another information block belonging to the same set is accessed, it is stored in the other buffer memory bank. Subsequently, when a third information block of the same set is accessed, one of the information blocks is displaced from the buffer memory bank to the content-addressed memory where it is stored with its tag and set bits. The system operates so that there is a high probability that a desired information block will be present and rapidly accessible in one of the buffer memory banks or the content-addressed memory.

3,699,534
CELLULAR ARITHMETIC ARRAY

William H. Kautz, Woodside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 15, 1970, Ser. No. 98,245
Int. Cl. G11c 9/00, 19/00; G06f 13/00
U.S. Cl. 340—172.5 2 Claims

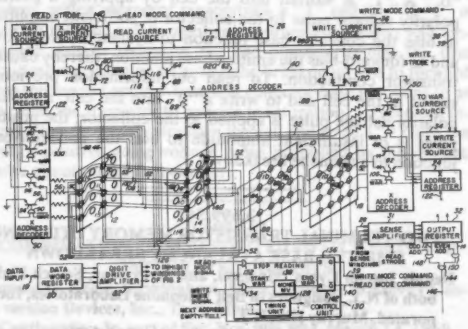


A cellular arithmetic array for use in a multiprocessor having the facility provided to either read-out, write-in, or increment by one the binary word stored in each row of the array during a single clock cycle.

3,699,535
MEMORY LOOK-AHEAD CONNECTION ARRANGEMENT FOR WRITING INTO AN UNOCCUPIED ADDRESS AND PREVENTION OF READING OUT FROM AN EMPTY ADDRESS

Stanley Frank Klein, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 1, 1971, Ser. No. 111,427
Int. Cl. G11c 11/02
U.S. Cl. 340—172.5 17 Claims

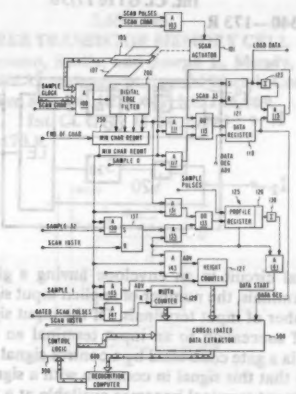


A memory interconnection or wiring arrangement which prevents a valid word in the memory from being destroyed by overwriting and also prevents an empty or obsolete memory word from being read out, thereby conserving both time and power. The arrangement involves the employment of one or two additional memory planes or additional bistable storage elements and circuitry which are used to store tag words which indicate whether a forthcoming memory address contains valid or obsolete information. In this arrangement, a tag or status indication signal is written in the additional memory elements to indicate that a word has been written into the current address location. Simultaneously, the state of a second tag or status indicating signal is read or detected to determine whether the forthcoming address location is empty or contains valid information. The detection of this tag during read out is used to determine whether the reading or writing process should continue, stop or search for another address location. The arrangement can be used with core memories, solid state memories, plated wire and thin film memories or any other device in which the interconnection or wiring between the main memory and additional storage and electronic elements can be controlled.

3,699,536
LOW COST RASTER SCANNED DATA CONSOLIDATION

David C. Roberts, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1971, Ser. No. 157,564
Int. Cl. G06k 9/06
U.S. Cl. 340—172.5 8 Claims

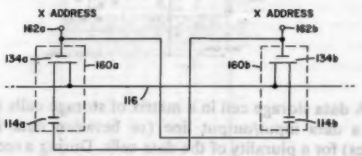


Data representing a character received from a raster scanner is simultaneously stored in a serial memory and presented to character dimension and location determining logic. After all of the data representing the character has been stored, the character dimension and location information is converted to an address for retrieving a data consolidation mask from a memory containing a plurality of masks. The data consolidation mask is stored in a second serial memory. The first serial memory and the second serial memory are recycled in synchronism to allow the contents of each to sequentially be presented to logic gates which compare the data in the first memory with the mask in the second memory to generate consolidated data representing the character.

3,699,537
SINGLE-RAIL MOSFET MEMORY WITH CAPACITIVE STORAGE

Sven E. Wahlstrom, Palo Alto, Calif., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 825,257, May 16, 1969, Pat. No. 3,533,089. This application Sept. 8, 1970, Ser. No. 70,353
Int. Cl. G11c 11/40
U.S. Cl. 340—173 R 2 Claims



In connection with a one-device-per-bit capacitive MOSFET memory array, various topologies are disclosed for developing optimum memory storage capacitances between isolated P-regions and the fixed-potential substrate or a fixed-potential line. In particular, a fixed-potential line can be

dispensed with, while retaining the improved capacitance associated therewith, by arranging the cells in pairs and cross-coupling them to one another. Particular clocking sequences and switching arrangements apposite to the cell topologies involved are also disclosed.

3,699,538

LOGICAL CIRCUIT

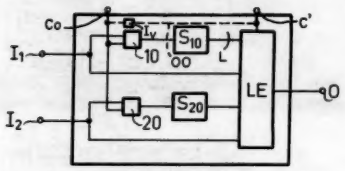
Hendrik Arie Van Essen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 73,156

Claims priority, application Netherlands, Sept. 20, 1969, 6914310

Int. Cl. G11c *11/36*

U.S. Cl. 340—173 R **6 Claims**



Logical circuit in an envelope having a given number of input terminals, the number of applied input signals exceeding the number of input terminals. Of the input signals applied in order of succession to an input terminal an earlier signal is stored via a gate controlled by a control-signal in a storage element so that this signal in common with a signal applied later to said input terminal becomes available at a group of logical elements of the logical circuit, in which group the signals can be processed simultaneously (FIG. 1).

3,699,539

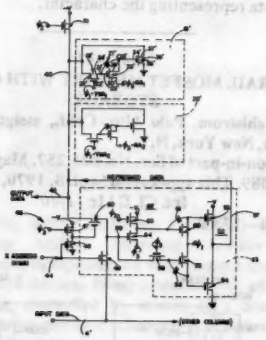
BOOTSTRAPPED INVERTER MEMORY CELL

John R. Spence, Villa Park, Calif., assignor to North American Rockwell

Filed Dec. 16, 1970, Ser. No. 98,790

Int. Cl. G11c *11/40, 11/24*

U.S. Cl. 340—173 R **13 Claims**



A data storage cell in a matrix of storage cells is connected to a data input/output line (or between data input/output lines) for a plurality of the data cells. During a recurring write interval, a write field effect transistor is turned on for applying a voltage potential representing a logic state to a storage capacitor from the input/output line. During a recurring precharge interval, the data line is restored to a first voltage level. During a recurring read interval, a bootstrapped field effect transistor driver is turned on (or not) by the voltage stored on the capacitor for driving a read transistor. The bootstrapped drive provides a relatively high drive voltage on the gate electrode of the read field effect transistor when the bootstrapped driver is turned on. The stored voltage (data) is inverted in the storage cell by the conduction or nonconduction of the read field effect transistor and is provided as an output on the data line. The inverted data is reinverted and rewritten into the storage cell during the recurring write interval of a data refresh cycle following the read/write cycle. If new data is to be stored, the old data is blocked and the new data is written into the data cell.

3,699,540

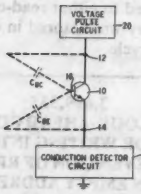
TWO-TERMINAL TRANSISTOR MEMORY UTILIZING COLLECTOR-BASE AVALANCHE BREAKDOWN

Dennis Joseph Lynes, Madison, and Jerry Mar, Scotch Plains, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1970, Ser. No. 103,169

Int. Cl. G11c *11/40*

U.S. Cl. 340—173R **16 Claims**



A semiconductor memory cell containing a single transistor having an uncontacted base is operated as a two-terminal device with a voltage pulse circuit coupled to the collector and a conduction detector coupled to the emitter. Bit information is written into the cell by setting the potential of the base to one of two values, which represent respectively a "1" and a "0." A "1" is written into the cell by applying a positive polarity voltage pulse to the collector of sufficient amplitude to bias the collector-base junction to avalanche breakdown and to forward-bias the emitter-base junction, thereby causing transistor conduction. To read out information previously stored in the cell and to write a "0" into the cell, a positive polarity voltage pulse is applied to the collector; the positive pulse is of insufficient amplitude to bias the collector-base junction to avalanche breakdown.

3,699,541

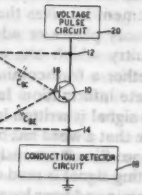
TWO-TERMINAL TRANSISTOR MEMORY UTILIZING EMITTER-BASE AVALANCHE BREAKDOWN

Dennis Joseph Lynes, Madison, and Jerry Mar, Scotch Plains, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1970, Ser. No. 103,167

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **14 Claims**



A semiconductor memory cell containing a single transistor having an uncontacted base is operated as a two-terminal device with a voltage pulse circuit coupled to the collector and

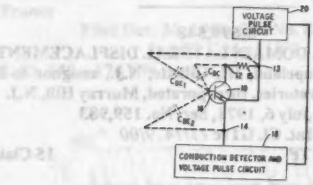
a conduction detector circuit coupled to the emitter. Bit information is written into the cell by setting the potential of the base to one of two values, which represent respectively a "1" and a "0." A "1" is written into the cell by applying a negative polarity voltage pulse to the collector of sufficient amplitude to forward bias the collector-base junction and to bias the emitter-base junction to avalanche breakdown. To read out information previously stored in the cell and to write a "0" into the cell, a positive going voltage pulse is applied to the collector.

3,699,542

TWO-TERMINAL TRANSISTOR MEMORY UTILIZING SATURATION OPERATION

Dennis Joseph Lynes, Madison, and Jerry Mar, Scotch Plains, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1970, Ser. No. 103,166
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **12 Claims**



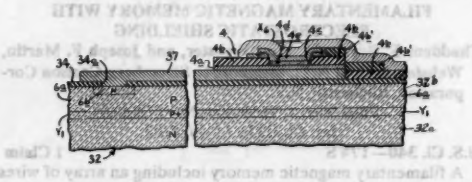
A semiconductor memory cell containing a dual emitter transistor having an uncontacted base is operated as a two-terminal device. A voltage pulse circuit connected to the first emitter, a conduction detector voltage pulse circuit is connected to the second emitter, and a resistor is connected between the first emitter and the collector. Bit information is written into the cell by setting the potential of the base of two values, which represent respectively a "1" and "0." A "1" is written into the cell by applying appropriate polarity and amplitude voltage pulses to the two emitters to bias the first emitter-base junction to avalanche breakdown and to forward bias the second emitter-base and collector-base junctions so as to cause the transistor to operate in saturation. To read out information previously stored in the cell and write a "0" into the cell, a positive going voltage pulse is applied by the voltage pulse circuit to the first emitter.

3,699,543

COMBINATION FILM DEPOSITED SWITCH UNIT AND INTEGRATED CIRCUITS

Ronald G. Neale, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. Nos. 806,994, March 13, 1969, abandoned, and Ser. No. 773,013, Nov. 4, 1968, Pat. No. 3,629,863. This application Dec. 22, 1969, Ser. No. 887,076
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **31 Claims**



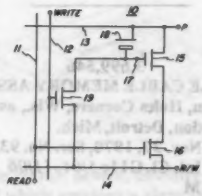
A semiconductor substrate, like a silicon chip having various doped regions forming circuit elements, has semiconductor switch-forming units deposited thereon. The integrated circuit semiconductor switch combination desirably may form a memory matrix where the substrate has spaced parallel, doped conductor-forming regions of a given conductivity type extending in spaced, generally parallel relation. Spaced parallel bands of conductive material are deposited on an insulating film on a face of the substrate and extend generally transversely of said spaced parallel conductor-forming regions of the substrate. A two terminal memory switch device is formed on the substrate adjacent each active cross-over point of the transversely extending conductors, each memory switch device including a deposited film of semiconductor memory material having spaced portions electrically coupled between the associated cross-over point.

3,699,544

THREE TRANSISTOR MEMORY CELL

Reuben E. Joynson, Scotia, and Joseph L. Mundy, Schenectady, both of N.Y., assignors to General Electric Company

Filed May 26, 1971, Ser. No. 146,969
Int. Cl. G11c *11/24*, *11/40*
U.S. Cl. 340—173 R **9 Claims**



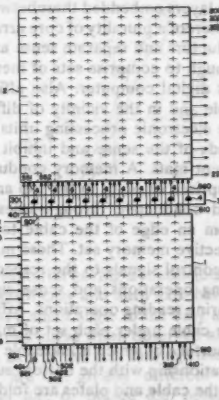
A three transistor dynamic memory cell is disclosed utilizing a voltage controlled capacitor to enhance signal coupling in the cell. In addition, the refreshing operation is greatly enhanced due to the configuration of the cell; viz. refreshing is achieved without an inverting amplifier, several cells can be refreshed simultaneously, and refreshing can occur while other operations are performed by the same cell.

3,699,545

ADAPTABLE ASSOCIATIVE MEMORY SYSTEM

Werner Erich Kluge, Kanata, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 117,591, Feb. 22, 1971, abandoned. This application Oct. 21, 1970, Ser. No. 191,260
Int. Cl. G11c *15/00*
U.S. Cl. 340—173 AM **25 Claims**



A rapid associative memory system has simultaneous inputs to many rows of an input matrix of identical subcircuits and

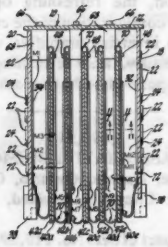
also multiple outputs connected to rows of an output matrix of another type of identical subcircuits, for simultaneously producing an output pattern. The matrix subcircuits each contain one or at most two bits of memory. The columns of the two matrices are 1-to-1 linked by circuits for quickly establishing, responding to, or erasing input-output associations. Through control circuits external to the matrix, association of a particular input pattern with a particular output pattern is accomplished by applying the output pattern to the output conductors of the output matrix during the presence of a selected input pattern. The system scans the columns of the matrices for an empty column before placing in the column memory the desired association of input and output patterns. Application of a null pattern to the output conductors during the presence of a selected input erases any previous association of that input pattern with a non-null output. The system is adapted to combine the latter step with writing in a new association for the selected input, in that case obviating the scanning operation. These changes can be made only when the system is switched from an operating to a training condition.

3,699,546

FLEXIBLE CABLE MEMORY ASSEMBLY

William E. McLean, Hales Corners, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1970, Ser. No. 93,139
Int. Cl. G11c *5/04*, *11/06*
U.S. Cl. 340—174 M **7 Claims**



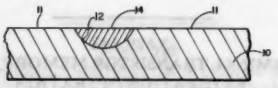
A flexible cable having top and bottom surfaces and top and bottom conductive layers embedded therebetween has affixed to the top surface thereof a plurality of core arrays having continuous drive conductors and separate sense and inhibit lines threaded therethrough to comprise sets of memory mats in a coincident current digital computer. Also affixed to the top surface of the cable and in the vicinity of different memory sets are respective electronic processing units which are terminated to the ends of the sense and inhibit lines threaded through the different mats. A memory conductor unique to each mat and comprised of paths in the top and bottom conductive layers and conductive through-holes therebetween communicates from an edge of the cable to the electronic units of each respective memory set. These memory conductors carry inhibit control signals to the respective electronic units during writing operations and sense signals from the electronic units during reading operations. Affixed to the bottom surface of the cable under each set of mats is a support plate, the bottom surface of which is mateable in heat transfer and supporting relationship with the bottom surface of an adjacent plate when the cable and plates are folded in an accordion-like manner. The edges of the alternate plates are then affixed in heat transfer and supporting relationship to encompassing structures.

3,699,547

MAGNETIC BUBBLE DOMAIN SYSTEM

John M. Owens, Newport Beach, and David M. Heinz, Orange, both of Calif., assignors to North American Rockwell Corporation

Filed March 12, 1971, Ser. No. 123,643
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **4 Claims**



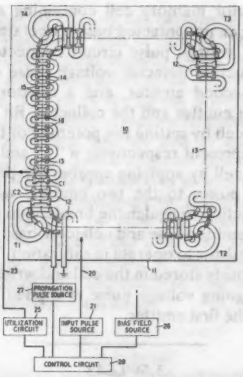
A magnetic bubble domain system having a strip or channel of film of magnetic bubble domain material associated with a supporting substrate is described. The surface of the strip of magnetic bubble domain material has a surface which is at substantially the same level as the surface of the adjacent material.

3,699,548

SINGLE WALL DOMAIN LATERAL DISPLACEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 6, 1971, Ser. No. 159,983
Int. Cl. G11c *11/14*, *9/00*
U.S. Cl. 340—174 TF **15 Claims**



The multistage rail arrangement known as the lateral displacement coding arrangement defines a pair of positions for a single wall domain in each stage of a closed loop channel. Turns in the path of a channel of this type are described which eliminate geometric distortions and consequently exhibit relatively high operating margins.

3,699,549

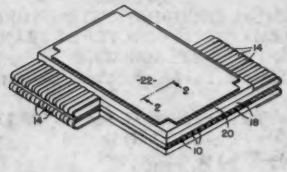
FILAMENTARY MAGNETIC MEMORY WITH ELECTROSTATIC SHIELDING

Thaddeus F. Bryzinski, West Webster, and Joseph F. Martin, Webster, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,132
Int. Cl. G11c *11/14*, *5/02*
U.S. Cl. 340—174 S **1 Claim**

A filamentary magnetic memory including an array of wires coated with a film of magnetic material about one micron thick. The wires lie in parallel array essentially in a single plane. Conductive strips extend normally across the wires on both sides, forming single turn loops around them. Thin sheets

of non-magnetic, electrically conductive material are disposed between the conductive strips and the coated wires. The



sheets constitute electrostatic shields, and are preferably arranged as narrow strips in register with the conductive strips. The sheets reduce the so-called common mode noise.

3,699,550

BINARY CODED INFORMATION STORES

Robert J. Spain, Needham Heights, Mass., assignor to Compagnie Internationale Bur L'Informatique, Louveciennes, France

Filed Dec. 30, 1969, Ser. No. 889,096
Int. Cl. G11c *11/02*
U.S. Cl. 340—174 TW 27 Claims

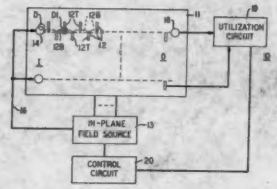
A circulating or recirculating register of binary coded information is comprised of a helical magnetic film path formed over an elongated and preferably cylindrical member with the easy magnetization axis of the film oriented substantially perpendicularly to the axis of the cylinder, and the binary values of the information bits represented as reversed orientations of the magnetization vector along the helical path. The circulation is assured by application of a rotating magnetic field, the axis of which is parallel to the length of the cylinder. The stasis or interruption of circulation when needed is assured by application of an alternating magnetic field on substantially the same axis. In a plural register store such registers are grouped and merged within the said rotating magnetic field.

3,699,551

DOMAIN PROPAGATION ARRANGEMENT

Robert Frederick Fischer, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 20, 1970, Ser. No. 82,426
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF 7 Claims



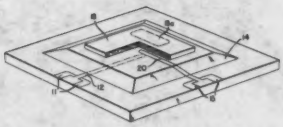
Single wall domains are moved generally in a slice of magnetic material by a magnetically soft T and bar-shaped overlay pattern on a single surface of the slice in response to a magnetic field rotating in the plane of the slice. The overlay pattern includes consecutive elements alternatively parallel to first then second orthogonal axes. Operational and manufacturing advantages are realized if overlay elements aligned with one axis are on one surface of the slice and the overlay elements aligned with the orthogonal axis are on the other, the relative positions of all elements with respect to one another in the plane of the slice being preserved otherwise.

3,699,552

MAGNETIC BUBBLE DEVICE AND METHOD OF MANUFACTURE

Raymond P. De Fabritis; Gerald Burt Fefferman, both of Parsippany; Bruce David Gesner, Dover, and Raymond John Radner, Chester, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1970, Ser. No. 102,794
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 3 Claims



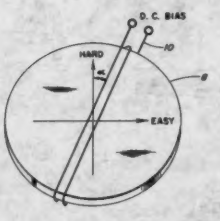
For a magnetic bubble device, circuitry and support structure is disclosed which employs a glaze layer. The glaze isolates two layers of control conductors from each other, supports a magnetic bubble crystal, houses a Hall-effect device and is transparent to allow transmission of polarized light for bubble observation and detection purposes.

3,699,553

NONDESTRUCTIVE READOUT THIN FILM MEMORY DEVICE AND METHOD THEREFOR

Henry S. Belson, Adelphi; Bernard F. DeSavage, Laurel, both of Md., and Robert S. Tebble, Wilmslow, England, assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 12, 1971, Ser. No. 114,920
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 10 Claims



A thin film material having a rectangular hysteresis characteristic along both easy and hard axes has a small d.c. biasing field applied at a small angle to the easy axis, producing a triangular hysteresis curve when observed along an axis perpendicular to the axis of the d.c. biasing field. The two resulting stable states are of greatly different permeability, thus enabling either a.c. or pulsed d.c. nondestructive readout. Switching is achieved by applying a saturating d.c. field along the axis perpendicular to the d.c. biasing field axis in either the

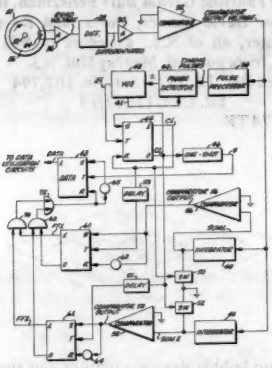
positive or negative direction, and the readout field is also applied along the axis perpendicular to the d.c. biasing field axis.

3,699,554

METHOD AND APPARATUS FOR DETECTING BINARY DATA BY INTEGRATED SIGNAL POLARITY COMPARISON

William H. Jones, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc.

Filed July 2, 1970, Ser. No. 51,899
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1 H **7 Claims**



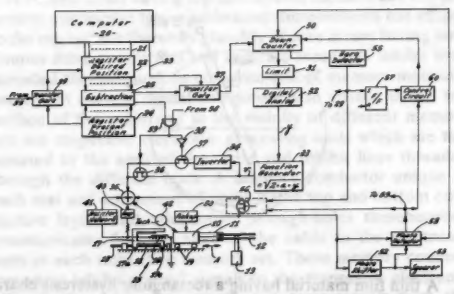
An apparatus and a method is disclosed in which binary data is retrieved from a medium on which data is stored. A read signal representative of the binary data is derived, differentiated, and integrated to obtain signals representative of the amplitude and polarity of the differentiated read signal. The integrated signals are compared to obtain the binary value of the data.

3,699,555

APPARATUS FOR RAPID ACTION DISPLACEMENT CONTROL

Wilbur E. Du Vall, Torrance, Calif., assignor to Zerox Corporation, Stamford, Conn.

Filed Oct. 23, 1970, Ser. No. 83,491
Int. Cl. G11b 21/08
U.S. Cl. 340—174.1 C **4 Claims**



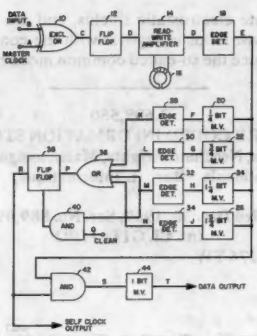
A transducer carriage for multiple, movable heads in a multiple disk file is displaced from one position to another one by a linear motor, whose stator is also mounted on a carriage for recoilless reaction to rapid acceleration/deceleration control of the motor coil. A command signal is developed to be proportionate to the square root of deceleration rate times distance to be traversed due to position change, particularly for determining the beginning of deceleration. Servo loops provide for initial acceleration control followed by the deceleration phase merging with a fine position control.

3,699,556

DIGITAL ENCODING SYSTEM WHEREIN INFORMATION IS INDICTED BY TRANSITION PLACEMENT

Shirzad Aghazadeh, Los Angeles, Calif., assignor to The Singer Company

Filed April 30, 1971, Ser. No. 139,110
Int. Cl. G11b 5/06
U.S. Cl. 340—174.1 G **6 Claims**



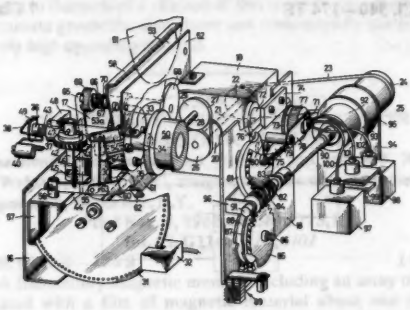
A digital, magnetic memory recording and demodulation system which doubles the bit density and thus the capacity of a memory using the phase modulation digital recording method. The normal "double pulse" phase modulation recording signal is divided so that the signal that is recorded on the magnetic medium contains a maximum of only one flux change per bit. The demodulation circuitry then senses the edges of the read-back signal, generates a self-clocking signal by the use of a bank of multivibrators that are preset to pulse for substantially one-quarter, three-quarter, one and one-quarter, and one and three-quarter bit time and, by gating the read-back signal with the self-clocking signal, reconstructs the original input signal.

3,699,557

GRAVITY FEED WITH AXIALLY MOVABLE ATTACHING MEANS

Heinz Kelch, Buchenberg, Germany, assignor to Kienzle Apparate GmbH, Villingen/Schwarzwald, Germany

Filed July 23, 1970, Ser. No. 57,706
Claims priority, application Germany, July 28, 1969, P 19 38 274.2
Int. Cl. G11b 3/62, 17/04
U.S. Cl. 340—174.1 C **13 Claims**



Apparatus for reproducing information which is recorded on concentric tracks of rotary disk-shaped carriers has a con-

tinuously driven motor which can be connected with a centering and rotating device for carriers and with a carriage which shifts the reproducing head into registry with a selected track of a centered carrier. The motor drives a timer wheel for generation of synchronizing pulses which are transmitted to a revolution counter. A programming circuit which receives signals from the counter and from the reproducing head controls a unit which records the reproduced information.

3,699,558

ANGULAR POSITION SENSORS

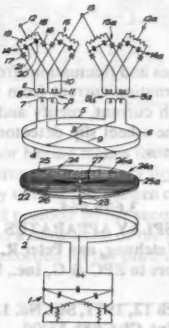
Dennis Alfred Hendley, London, England, and Sipko L. Boersma, Delft, Netherlands, assignors to Decca Limited, London, England

Filed July 13, 1970, Ser. No. 54,224

Claims priority, application Great Britain, July 14, 1969, 35,389/69

Int. Cl. G08c 19/06

U.S. Cl. 340—196 13 Claims



A rotatable insulating disc carries a closed grid of conductors over one part of one side and a similar but open grid over another part. An oscillator is coupled to a coil which is parallel to the disc and produces a cyclically varying but symmetrical field through the disc. Two pairs of pick-up coils sense, for respective orthogonal directions, the distortion of the field by the closed grid and detector circuits coupled to the pick-up coils provide signals representing the sine and cosine of the angular position of the disc which may carry a compass needle.

3,699,559

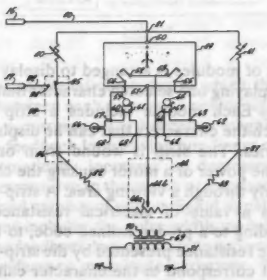
CONDUCTIVE FLUID CONTENT DETECTION SYSTEM

Julius H. Bochinski, Bethesda, Md., assignor to Enviro Control, Inc., Washington, D.C.

Filed Jan. 7, 1971, Ser. No. 104,595

Int. Cl. G08b 21/00; G01n 27/00

U.S. Cl. 340—236 8 Claims



A detector assembly for measuring and monitoring quantities of particulate matter suspended in a fluid stream which is structured for injection of a flushing fluid therein. The assembly comprises a fluid sampling enclosure having electrically conductive plates which form cavities at either end of the enclosure and a conduit between these plates for passing the fluid stream. Flushing fluid is injected in the cavities, which fluid passes into the fluid stream through holes in the plates thereby maintaining the plates clean. A bridge circuit in which the plates and the fluid stream constitute an arm of the bridge is used for monitoring and measuring the change in resistance between the plates due to dissolved ions in the fluid stream, or dissolved solids therein.

3,699,560

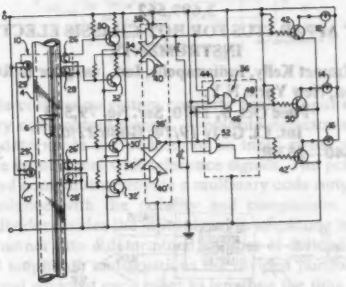
PRECISION POSITION INDICATOR

Joseph R. J. Meunier, Xenia, and Heinrich J. Wieg, New Burlington, both of Ohio, assignors to The Bendix Corporation

Continuation of Ser. No. 691,528, Dec. 18, 1967. This application Oct. 8, 1970, Ser. No. 79,268

Int. Cl. G08b 21/00

U.S. Cl. 340—239 R 8 Claims



An arrangement for providing indicator signals corresponding to the position of a movable object along a path including a pair of spaced limit stations, each in turn comprised of a pair of photocell sensors which produce high-low output signals when shaded or unshaded, respectively, by the movable object, and which are spaced so as to be simultaneously shaded as the object moves past the limit station. Logic circuitry decodes these signals along these stations to provide a first indicator signal if the object unshades one of the sensors moving in one direction away from the other and a second indicator signal if the object unshades the sensor moving in another direction towards the other station by using the high-low signals of the other sensor at the station. The other station is similarly arranged to provide a third indicator signal in response to the high-low signals upon unshading of the outermost sensor relative to the other station by the object in moving a direction away from the other limit station and producing one of the indicator signals produced by the other limit stations upon unshading of the sensor by the object moving towards the other limit station, to thus provide an indication of the presence or absence of the movable object from the zone between the stations, and whether it is above or below the zone.

3,699,561

SHUNT ACTUATED FLUID LEVEL SENSOR

James Basil Putt, South Bend, Ind., assignor to The Bendix Corporation

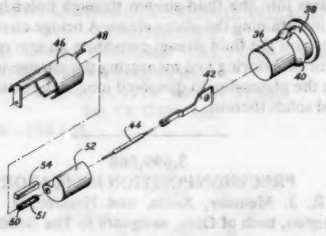
Filed May 24, 1971, Ser. No. 146,338

Int. Cl. B60t 17/22

U.S. Cl. 340—244 E 7 Claims

A fluid level sensor is disclosed for use in a vehicle master cylinder or other contained volume comprising a horizontally mounted reed switch connected to appropriate indicator cir-

cuitry for warning the vehicle operator of a low fluid condition. The switch is actuated by a unique eccentric float which carries a shunt disposed between a fixed magnet and the reed switch. As the float moves with the fluid level, the shunt



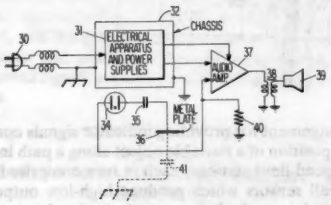
likewise moves from a first position which permits the magnetic flux from the magnet to bypass the reed switch, to a second position in which its shunting effectiveness is removed and the magnetic flux of the magnet actuates the reed switch, which in turn energizes the indicator circuit.

3,699,562

SAFETY APPARATUS FOR HOT-CHASSIS ELECTRONIC INSTRUMENTS

Gordon Emmet Kelly, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,573
Int. Cl. G01r *19/14*; G08b *21/00*
U.S. Cl. 340—253 R **3 Claims**



A safety indicator for electrical apparatus having a chassis connected to one side of the A.C. power provides a visual or audible indication. The indication is provided by means connected between the chassis and a conductive element electrically isolated from the chassis. When the element is touched by an operator with the plug coacting with the A.C. lines and with the chassis above reference potential due to the coaction, an indication is provided thus producing a warning that the plug has to be reversed.

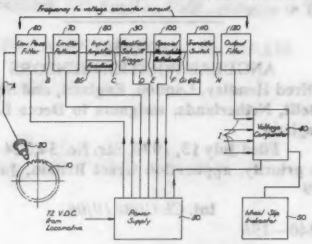
3,699,563

WHEEL SLIP DETECTOR

George R. Cass, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Division of Ser. No. 691,669, Nov. 21, 1967, abandoned. This application Nov. 25, 1969, Ser. No. 879,726
Int. Cl. G08b *21/00*
U.S. Cl. 340—268 **5 Claims**

The fact that one drive axle of a railway locomotive is rotating faster than another due to 'wheel slip' of the wheels on the faster driving axle is detected by the circuitry of this invention. The rotation of each of two or more drive axles is caused to generate a cyclically varying signal which cyclic variation includes a frequency proportional to the rotational speed of the drive axle. The circuitry provides a signal whose magnitude varies as such frequency and the magnitudes of such signals are compared with each other to obtain an indication of wheel slip of an undesirable amount. A power supply and associated circuitry are provided for deriving from the locomotive supply potentials for operating the electronic circuitry of the wheel slip detector. Such power supply is arranged to eliminate the



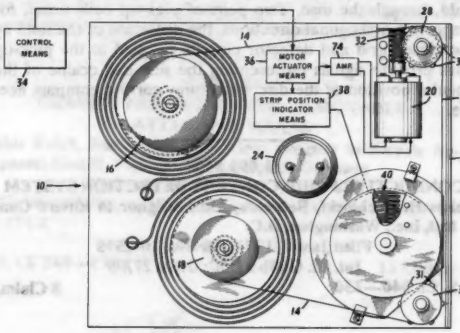
effects of voltage surges and fluctuations from the locomotive supply, to create alternating current from the direct current supply, transform such current, rectify and regulate it. Such supply is useful for the wheel slip detector circuitry and for other electrical functions.

3,699,564

DISPLAY APPARATUS

Thomas Hodge, Jr., Watchung, and Peter R. Bradie, Montvale, both of N.J., assignors to EPC & G, Inc., Plainfield, N.J., by said Hodge

Filed March 12, 1971, Ser. No. 123,791
Int. Cl. G08b *23/00*
U.S. Cl. 340—317 **1 Claim**

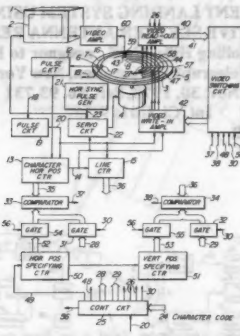


A multiplicity of modules is arranged to display a message, each module displaying one selected character that forms part of the message. Each module includes a strip of flexible material on which the characters that can be displayed are arranged in a series. The strip is wound from one spool to another under the power of a motor causing the characters to move successively through a viewing area. A strip-position-indicator presents a value of electrical resistance that corresponds, according to a predetermined code, to the position of the strip. If the resistance presented by the strip-position-indicator does not correspond to the character called for by a control means, a motor actuator causes the strip to be wound in the appropriate direction until that character is reached.

3,699,565
VIDEO GENERATOR

Hiroshi Nagai, Chigasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1971, Ser. No. 139,506
Claims priority, application Japan, May 4, 1970, 45/37518
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 3 Claims

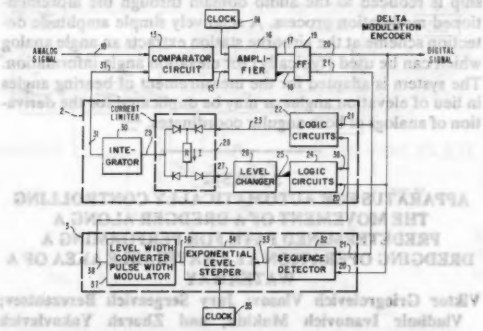


A video generator having means for selectively reading out one of many patterns recorded on a first track of a magnetic disc and repeatedly writing this pattern on a second track. The pattern at a desired position on the second track is solely read out to be written on a third track of the magnetic disc, and the video signal thus recorded on the third track is displayed on a CRT display.

3,699,566
DELTA CODER

Hans R. Schindler, Steinacherstrasse 85, Aargaw, Switzerland

Filed Oct. 16, 1970, Ser. No. 81,489
Claims priority, application France, Oct. 16, 1969, 6935813
Int. Cl. H03k *13/22*
U.S. Cl. 340—347 AD 5 Claims

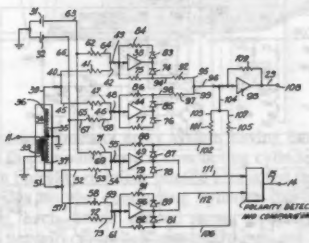


An analog to digital converter in which the instantaneous difference between each successive analog signal sample magnitude and a corresponding reference magnitude is digitally encoded. A feedback loop having non-linear reference setting means automatically increases or decreases the reference magnitude responsive to the match or mismatch condition of a predetermined number of output digital signals. The reference setting means includes the pulse width modulating of control signals in the feedback loop to provide accurate control of the non-linear reference magnitude variations. The direction of change is determined by the digital output signal polarity. However, if a predetermined succession of output digits match, then a first exponential time rate of change is used in incrementing the reference level. Otherwise, exponential incrementing occurs at a second time rate of change.

3,699,567
ANALOG CODE CONVERSION SYSTEM

Zen'iti Kiyasu, Sendai; Masao Kawashima; Shunroku Sasaki, both of Yokohama; Yukihiko Mineshima, and Shyoichi Kurita, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 644,295, June 7, 1967, abandoned. This application Dec. 9, 1970, Ser. No. 96,600
Claims priority, application Japan, June 10, 1966, 41/37404
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 5 Claims

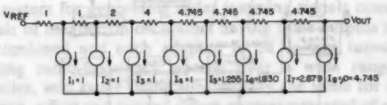


A code conversion system converts analog input signals to multinary code output signals. A polarity detector and comparator determines the polarity of an input signal and compares the input signal with reference signals. The polarity detector and comparator provide a multinary code output signal in accordance with the polarity and comparison. An amplitude divider divides the input signal in amplitude in a determined manner into a determined number of divided portions of equal amplitude and positions the divided portions of the input signal adjacent each other to lengthen the time duration of the divided portions. An amplifier amplifies the output signal of the amplitude divider a number of times equal to the determined number of divided portions. A time delay prevents overlap of the signal at the output of the amplifier with the signal supplied to the input of the amplitude divider. The amplitude divider, the amplifier and the time delay are connected in series circuit arrangement in a closed loop between the input of the system and the input of the polarity detector and comparator.

3,699,568
WEIGHTED LADDER TECHNIQUE

James E. Thompson, Scottsdale, and Gerald J. D'Amato, Mesa, both of Ariz., assignors to Motorola, Inc., Franklin, Ill.

Filed Dec. 21, 1970, Ser. No. 99,765
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA 5 Claims



There is disclosed a weighted ladder network for use in digital to analog converters which s characterized by faster speeds than the common R/2R and binary ladder configurations for the same total power consumption. The technique involves splitting up a conventional ladder network into two separate sections. The first section is a conventional binary ladder driven by equal current sources. The second section, however, involves weighting the resistance elements and the

current sources in such a manner that the total resistance of the circuit is minimized.

3,699,569

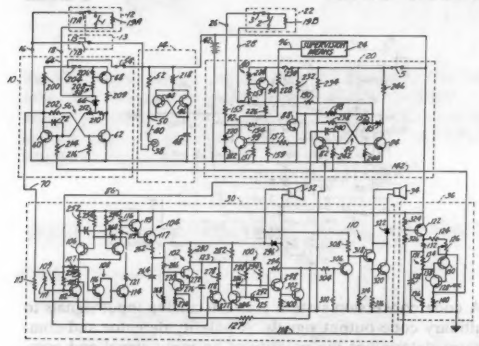
SECURITY SYSTEM FOR INDICATING FIRE, INTRUSION OR THE LIKE

John H. Lee, Woodbury Township, Washington County, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 839,007, July 3, 1969, abandoned. This application Jan. 28, 1972, Ser. No. 221,721

Int. Cl. G08b *19/00, 29/00*

U.S. Cl. 340—409 **13 Claims**



A fire-intrusion system of the type including at least one electrically continuous closed-loop for detecting the presence of an intruder and at least one electrically continuous closed-loop for detecting a fire wherein breaches in security indicative of fire and intrusion are sensed by a change in potential at a point in their respective loops. Potential sensing circuits are provided which are responsive to a changed or abnormal potential to indicate a fire, intrusion or inoperative circuit condition.

3,699,570

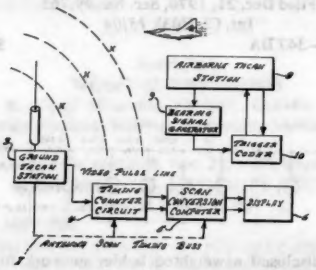
TACAN GROUND STATION TRACK AND DISPLAY SYSTEM

Donald W. Hanson, and Ralph W. Mifflin, both of Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 10, 1970, Ser. No. 70,969

Int. Cl. G01s *9/56*

U.S. Cl. 343—6 R **1 Claim**



A lightweight secondary ground radar type function is achieved by modification of standard TACAN equipment. Participating aircraft range and angle information is derived at the ground station from modified aircraft to ground station TACAN signals. This eliminates the need for a separate data link. The technique comprehends triggering the airborne TACAN transponder with the received North burst and transmitting from the aircraft time coded signals which indicate bearing of the plane from the TACAN ground site. The technique permits the ground station to compute several aircraft positions and display them as a radar type of presentation.

3,699,571

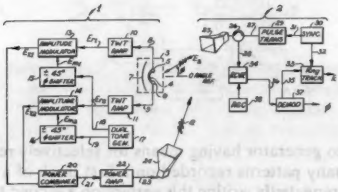
INSTRUMENT LANDING SYSTEM USING A RETRODIRECTIVE SLETTEN ANTENNA RESPONSER

Lon L. Sanders, Rolling Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 30, 1970, Ser. No. 93,731

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.5 R **10 Claims**



A radar responser (beacon) system including an interrogating airborne station which receives range and angle coded replies from an otherwise quiescent ground station. A Sletten antenna is employed at the ground station because of its relative simplicity and unique output phase relationships as a function of the angle of arrival of a received signal. The angle of arrival information of the Sletten Antenna phase relationship is transposed to audio modulation for retransmission back to the airborne unit. The interrogating pulses are "played back" to an airborne range tracker for range determination, and the Sletten antenna receive signal terminal phase relationship is reduced to the audio domain through the aforementioned modulation process. A relatively simple amplitude detection scheme at the airborne station extracts an angle analog which can be used (typically) for elevation angle information. The system is adapted for the measurement of bearing angles in lieu of elevation angles or may be duplicated for the derivation of analogs of both angular coordinates.

3,699,572

APPARATUS FOR AUTOMATICALLY CONTROLLING THE MOVEMENT OF A DREDGER ALONG A PREDETERMINED PATH FOR PERFORMING A DREDGING OPERATION AT A NAVIGABLE AREA OF A WATERWAY

Viktor Griogroievich Vlasov; Jury Sergeevich Berezentsev; Vladimir Ivanovich Mukhin, and Zhorzh Yakovlevich Kravchenko, all of Novosibirsk, U.S.S.R., assignors to Novosibirsky Institut Inzhenerov Vodnogo Transporta, Novosibirsk, U.S.S.R.

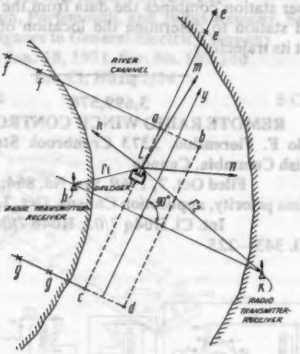
Filed Nov. 10, 1969, Ser. No. 875,122

Int. Cl. G01s *9/04*

U.S. Cl. 343—7 ED **4 Claims**

An apparatus for controlling automatically the movement of a dredger along a predetermined path for performing a dredging operation at a navigable area of a waterway, comprising receiving-transmitting radio stations, a unit adapted to measure the difference between the distances from the dredger to a pair of receiving-transmitting radio stations located exteriorly of the dredger, a second unit adapted to measure the sum of these distances and a correction unit. The

apparatus features a high reliability and ensures high accuracy of controlling the progress of the dredger along the predetermined path, as well as a high accuracy of re-positioning the dredger at a spot where it had been operating prior to having been removed therefrom for letting other ships pass.

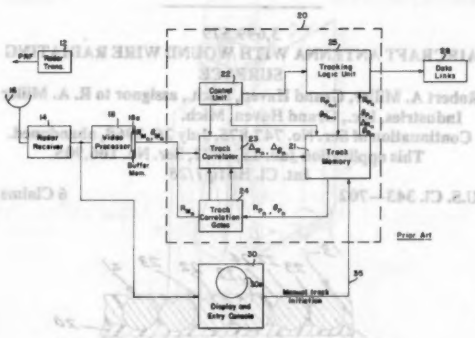


3,699,573

SYSTEM FOR AUTOMATIC INITIATION OF TARGET TRACKING IN TRACK-WHILE-SCAN RADAR

La Vern A. Andrews, Fullerton, and Donald A. Muchlinski, La Habra, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1966, Ser. No. 548,822
Int. Cl. G01s 9/14
U.S. Cl. 343—7.3 **10 Claims**



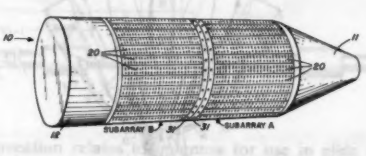
A track-while-scan radar system that initiates tracking of a target on the basis of previous position information or plots stored in the main memory of a computer. If a new plot correlates with the updated position of one of the targets, a new updated target position is stored in the main memory, and if the plot does not correlate, it is stored in a temporary memory for subsequent correlation. If the new plot correlates with the plots in the temporary memory, the plots are transferred to the computer main memory. Any plots in the temporary memory which do not correlate during a selected number of succeeding scans are cleared from that memory as they are assumed to be spurious plots.

3,699,574

SCANNED CYLINDRICAL ARRAY MONOPULSE ANTENNA

Francis J. O'Hara, and Troy E. Plunk, both of Bedford, Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 16, 1969, Ser. No. 867,101
Int. Cl. G01s 9/22
U.S. Cl. 343—16 M **4 Claims**



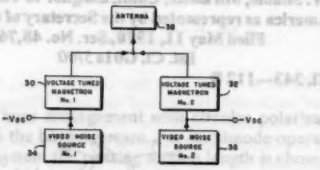
A cylindrical antenna array system having two cylindrical subarrays flush mounted on a conducting cylinder, each consisting of a plurality of linear phased arrays fed through a pair of feed rings on the conducting cylinder that has a diode switch for each linear phased array coupled through a switching network to switch one-quarter to one-third of the linear phased arrays ON in a rotating manner to scan throughout 360° around the cylinder axis, and each linear phased array having a pair of rotatable dielectric slabs behind the waveguide slots thereof with all dielectric slabs mechanically coupled to rotate in synchronism to phase the radio waves for angular direction with respect to the cylinder axis, the received signals being coupled through a magic-T junction to provide sum and difference monopulse signals of targets in sight of the antenna.

3,699,575

EXPANDABLE BANDWIDTH RADAR JAMMER

Philip H. Peters, Jr., Schenectady, and Donald A. Wilbur, Albany, both of N.Y.

Filed March 4, 1955, Ser. No. 492,326
Int. Cl. G01s 7/42; H04k 3/00
U.S. Cl. 343—18 E **9 Claims**

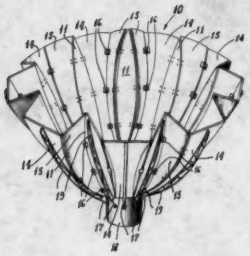


2. A system for generating radar jamming signals comprising a pair of magnetron oscillators having their outputs additively combined and each adapted to be voltage tuned for generating radio-frequency energy over a wide range of frequencies, said range being substantially the same for each magnetron, a first and second direct-current potential of given magnitude applied as respective anode voltages to each of said magnetrons whereby each of said magnetrons generates radio-frequency energy at a frequency which is substantially at the center of said range of frequencies, and means for independently varying the magnitudes of said given anode potentials in a random manner whereby the combined output from said magnetrons results in noise signals varying randomly in amplitude and frequency.

3,699,576
COLLAPSIBLE REFLECTOR

Sigurd Hoyer, Rockville, Md., assignor to Fairchild Industries, Inc.

Filed July 7, 1970, Ser. No. 52,890
Int. Cl. H01q 15/16
U.S. Cl. 343—18 B 10 Claims

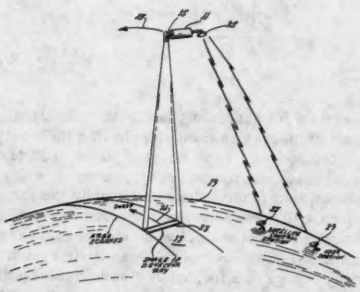


A collapsible dished paraboloid reflector having an array of petals that surround and have petals that are rotatably connected at their inner ends to a reflector hub. The array of petals comprises a series of substantially spear tip shaped or lanceolate shaped petals that alternate between semi-hour glass shaped petals. Substantially wedge shaped petals are located between and have lateral edges that are rotatably connected in edge to edge relationship to each lanceolate shaped petal and semi-hour glass shaped petal. The edges of the petals when viewed from the focal point of the fully deployed reflector substantially approximates the parabolic radial curvature of the fully deployed reflector. The lanceolate shaped petals and the semi-hour glass shaped petals are of rigid construction lengthwise so that they are not capable of flexing in a lengthwise direction whereas the wedge shaped petals are of relatively flexible construction lengthwise so that they are capable of flexing lengthwise as the reflector assembly is being deployed or collapsed. The construction of the collapsible reflector permits it to be collapsed into a compact package and permits the reflector to be deployed to present a dished rigid paraboloid shaped surface.

3,699,577
METHOD AND SYSTEM OF SURVEILLANCE PROCESSING

Paul W. Shadle, Miraleste, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 11, 1970, Ser. No. 48,761
Int. Cl. G01s 5/00
U.S. Cl. 343—112 R 3 Claims

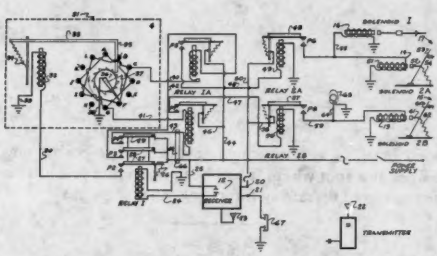


Surveillance of missile tracks is obtained by a satellite having a series of sensors that activate an image storage tube which is periodically slit scanned. The scan data is processed to determine when the length of the series of images is sufficient to represent a missile track and the information is transmitted to a ground control station and a ground user station. By transmitting signals the control station controls the threshold levels, blanking, and the data processing program. The user station combines the data from the satellite and the ground station to determine the location of the missile and predict its trajectory.

3,699,578
REMOTE RADIO WINCH CONTROL UNIT

Antonio F. Fiorentino, 2373 Cranbrook Street, Cranbrook, British Columbia, Canada

Filed Oct. 7, 1969, Ser. No. 864,308
Claims priority, application Canada, Oct. 7, 1968, 031,781
Int. Cl. H04q 7/02; H04b 7/00
U.S. Cl. 343—225 2 Claims

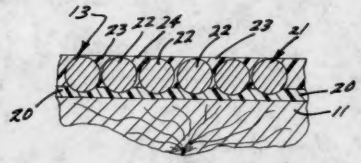


A hand-held radio frequency transmitter-receiver and drive-engine control device for remotely controlling a winch, crane or other similar winding apparatus comprising a hand-held transmitter generating an r. f. signal, a remote receiver detecting and amplifying the r. f. signal, and relays further amplifying the output from the receiver to energize selectively solenoids controlling the associated winch and winch engine to provide forward-reverse winding control of the winch and speed and power control of the winch engine.

3,699,579
AIRCRAFT ANTENNA WITH WOUND WIRE RADIATING SURFACE

Robert A. Miller, Grand Haven, Mich., assignor to R. A. Miller Industries, Inc., Grand Haven, Mich.

Continuation of Ser. No. 747,875, July 26, 1968, abandoned.
This application Jan. 15, 1971, Ser. No. 106,905
Int. Cl. H01q 1/28
U.S. Cl. 343—702 6 Claims



An antenna particularly adapted for use on aircraft having an elongated mast with a transmission assembly positioned therein in conventional fashion. The radiating element includes an elongated conductor such as copper wire or the like wound helically around the mast such that adjacent segments thereof lie in close abutment. The conductor is bonded to the mast by means of an electrically conductive bonding agent whereby the resultant radiating element simulates from a polarization standpoint a radiating element which has been plated or otherwise affixed to the mast in continuous sheath form. A second layer of electrically conductive bonding agent

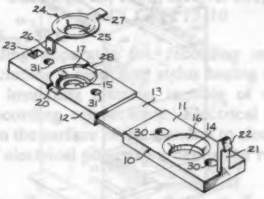
is applied to the surface of the radiating element subsequent to winding of the conductor thereabout.

3,699,580

ANTENNA MOUNTING CLIP

Raymond S. Joseph, Portsmouth, and Julius Kemeny, Suffolk, both of Va., assignors to General Electric Company

Filed Jan. 18, 1971, Ser. No. 107,146
Int. Cl. H01q *1/24*
U.S. Cl. 343—702 **5 Claims**



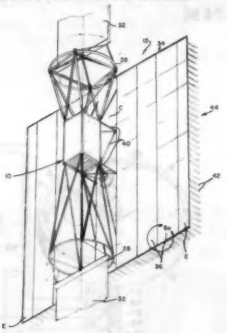
A nonconductive mounting clip, to secure an antenna to a cabinet or the like, having two nonconductive members forming a socket to receive a spherical element on the antenna. The members are interconnected at one end by a locking means and at the other end by either a locking means or a resilient hinge. A conductive contact member may be disposed between the spherical element and one of the nonconductive members to provide electrical connection from the conductive spherical element to associated circuitry.

3,699,581

LARGE AREA DEPLOYABLE SPACECRAFT ANTENNA

Charles H. Hall, Redondo Beach; Albert L. Young, Cypress, and N. Keith Young, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed June 25, 1970, Ser. No. 49,611
Int. Cl. H01q *1/28*
U.S. Cl. 343—705 **11 Claims**



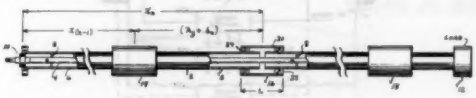
A large area deployable antenna for a spacecraft to be enclosed in a cylindrical shroud during launch. The antenna includes a reflector having a number of panels hinged edge-to-edge on hinge axes parallel to the central axis of the spacecraft body and mounting antenna elements, such as collapsible phased array elements and means for mounting at least one of the central reflector panels on the spacecraft body and for folding of the remaining panels into a stowed configuration, wherein the several panels are symmetrically arranged about the body within an envelope slightly smaller than the interior of the spacecraft shroud, and a deployed configuration, wherein the panels are located substantially in a common plane to form an antenna array which is symmetrical relative to a plane normal to the deployed reflector and containing the spacecraft body axis. The panels are releasably secured in stowed configuration during launch and unfolded to deployed configuration by spring action in orbit.

3,699,582

SLOTTED CABLE GLIDE SLOPE ANTENNA

Chester B. Watts, Jr., 6505 Pinecrest Court, Annadale, Va.

Filed Dec. 16, 1070, Ser. No. 98,594
Int. Cl. H01q *13/10*
U.S. Cl. 343—739 **5 Claims**



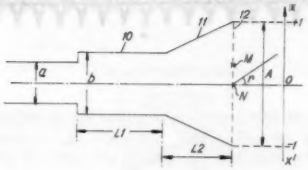
This invention relates to antennas for use in glide slope systems for the instrument landing of airplanes. The antenna disclosed here may be used, as a phase-compensating element, in an end-fire glide slope array, to control the slope angle over a desired azimuth sector. A coaxial transmission line, fed from one end, has a number of gaps in the outer conductor which leak current onto the outside surface of the line. The separation between gaps varies along the line, being chosen to give a predetermined phase distribution of the radiation current. Tuning to an assigned frequency channel may be accomplished by filling the line to a specified pressure with a gas of relatively high dielectric constant.

3,699,583

PHASE CORRECTION APPARATUS FOR CIRCULAR POLARIZATION OPERATION MONOPULSE ANTENNA HORN

Daniel Edmund Beguin, Saint-Prix, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 26, 1971, Ser. No. 166,065
Int. Cl. H01q *19/00*
U.S. Cl. 343—756 **3 Claims**



A multimode horn arrangement with circular polarization grid inserted into the horn aperture. For multimode operation of a monopulse system the phasing section length is chosen to compensate for polarizer phase errors.

3,699,584

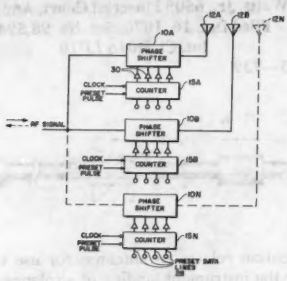
INSERTION PHASE CORRECTION OF PHASE SHIFTERS BY PRESETTING BINARY COUNTERS

George A. Hrivnak, and Vincent J. Organic, both of Neptune, N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 30, 1970, Ser. No. 102,748
Int. Cl. H01q *3/26*; H01p *1/32*
U.S. Cl. 343—854 **6 Claims**

This invention relates to a method of inserting into a phase shifter the necessary amount of insertion phase shift to correct for departure of phase shift from an acceptable value for that phase shifter resulting from normal inadequate production tolerances. The method involves using in the logic-driver cir-

cuit for the phase shifter a counter whose digital output determines the magnitude of the phase shift command applied to the phase shifter. The input to the counter is preset in accordance with the amount of phase shift correction determined from the phase shift measuring test to be necessary to correct for the undesired phase deviation in the manufacturing process.

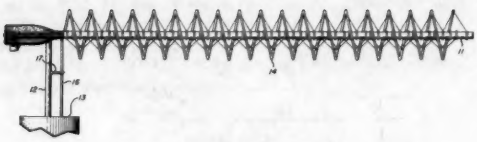


3,699,585

COLLAPSIBLE HELICAL ANTENNA

Adrian O. Morrison, Tustin, Calif., assignor to North American Rockwell Corporation

Filed Dec. 17, 1970, Ser. No. 99,172
Int. Cl. H01q *1/36*
U.S. Cl. 343—880 **11 Claims**



A collapsible helical antenna formed of an extensible boom made of preferably two coiled flat steel ribbons which, when uncoiled, become tubular one inside the other and formed of a helical conductor that is suspended coaxially from the boom by a plurality of rings disposed around the boom and tied together by flexible members and by tensioned members extending from the rings to the helical conductor so that, as the boom is extended, the rings slide along the boom to become separated a distance determined by the flexible members but the helical wire is still maintained coaxial with the boom.

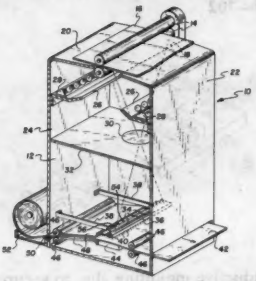
3,699,586

COPYING DEVICE INCLUDING RADIATION SENSITIVE MEMBERS ELECTRICALLY RESPONSIVE TO THE REFLECTED IMAGE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed April 30, 1970, Ser. No. 33,466
Int. Cl. G01d *15/06*; H04n *1/30*
U.S. Cl. 346—74 E **11 Claims**

A copying device in which the original is scanned by a radiation source, and the radiation reflected from the original is projected onto a plurality of radiation sensitive members electrically connected to corresponding conducting elements. The conducting elements transmit current to an electrically conducting copy paper which is sensitive to current and/or heat to form images on the copy paper. The elements conduct a varying current in proportion to the radiation impinging on the radiation sensitive members for producing a copy locally or remotely of the original on the current and/or heat sensitive copy paper.

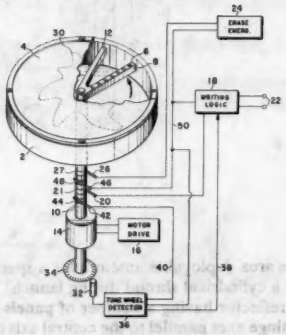


3,699,587

P.P.I. DISPLAY UTILIZING MAGNETIC RECORDING APPARATUS

William E. Currie, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 22, 1971, Ser. No. 164,987
Int. Cl. G01d *9/00*, *15/12*
U.S. Cl. 346—74 M **7 Claims**



A P.P.I. type display uses a display face having a suspension of magnetically orientable and light reflective particles which are orientable between two incident light reflecting states. A rotating erasing means is used to uniformly orient the particles into the first state while a rotating recording means carrying discrete recording elements is selectively actuated to orient

selected ones of the particles into the second state. The erasing means and recording means are mounted on separate arms connected together at one end to a common motor driven shaft located at the center of the display face and perpendicular thereto.

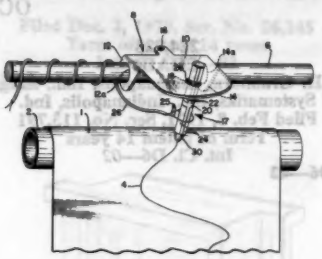
3,699,588

RECORDER FOR RECORDING ON HEAT-SENSITIVE MATERIAL

Bertil Eck Warrington, and Michael J. Cash, both of Phila., Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 28, 1970, Ser. No. 101,619
Int. Cl. G01d *15/10*
U.S. Cl. 346—139 C **9 Claims**

A recording apparatus for recording on heat-sensitive material including a recording stylus having a mandrel of an electrically insulating material capable of withstanding an elevated recording temperature. Electrical conductors are deposited on the surface of the mandrel to electrically connect a source of electrical power to a deposit of resistive material on a characterized recording end of the mandrel. The mandrel is attached to a stylus support arranged to be selectively driven across a recording material with the electrical conductors being electrically isolated from the stylus support.

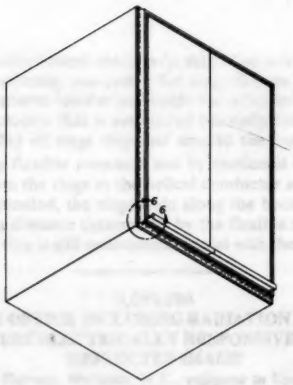


DESIGNS

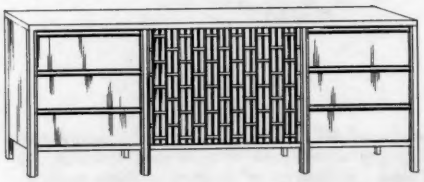
OCTOBER 17, 1972

224,923
CHAIR
Robert H. Grabhorn, Indianapolis, Ind., assignor to Systematiks, Inc., Indianapolis, Ind.
Filed Feb. 8, 1971, Ser. No. 113,791
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—42

224,924
CABINET
Allen E. Inhelder, Palo Alto, Calif., assignor to J. W. Cross Co., Palo Alto, Calif.
Filed Sept. 8, 1970, Ser. No. 24,867
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

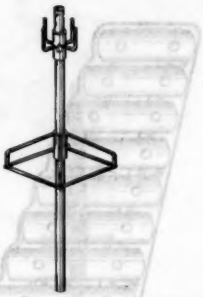


224,925
DRESSER OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 13, 1970, Ser. No. 24,473
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—160

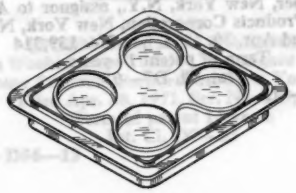


224,926
BREAKFRONT ARMOIRE OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 13, 1970, Ser. No. 24,472
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169

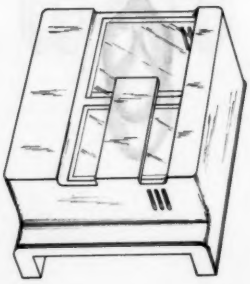
224,927
GARBAGE CAN HOLDER
Frank Arnold, Jr., 415 Lindhardt Road, Carlisle, Iowa 50047
Filed Apr. 28, 1971, Ser. No. 138,408
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—234



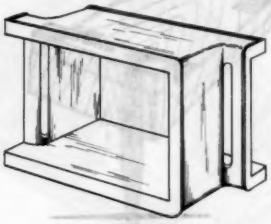
224,928
FREEZER STORAGE TRAY FOR COMESTIBLES OR THE LIKE
Robert L. Wiley, Lake Forest, Ill., assignor to SI Lite Incorporated, Chicago, Ill.
Filed Jan. 7, 1971, Ser. No. 104,841
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



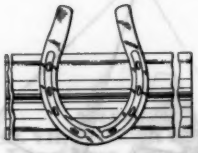
224,929
OUTER WALL CONSTRUCTION UNIT
Ralf Schuler and Ursulina Witte, Berlin, Germany, assignors to Paul M. Buenger, Frankfurt am Main, Germany
Filed Dec. 2, 1970, Ser. No. 26,244
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1



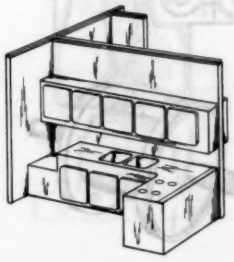
224,930
BUILDING CONSTRUCTION UNIT
Ralf Schuler and Ursulina Witte, Berlin, Germany, assignors to Paul M. Buenger, Frankfurt am Main, Germany
Filed Dec. 2, 1970, Ser. No. 26,245
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1



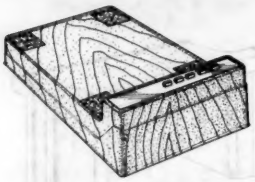
224,931
COMBINED VEHICLE BUMPER AND GUARD
Herbert C. Bonner, 13844 Anglin, Detroit, Mich. 48212
Filed July 13, 1970, Ser. No. 23,921
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



224,932
COMBINED KITCHEN-BATH AND WALL UNIT
Ralf Schuler and Ursulina Witte, Berlin, Germany, assignors to Paul M. Buenger, Frankfurt am Main, Germany
Filed Dec. 2, 1970, Ser. No. 26,246
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D34—50



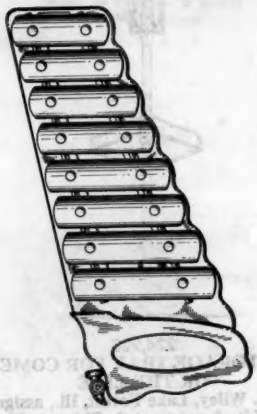
224,933
TELEPHONE ACCESSORY
Robert C. Guldstrand, 8600 Oakdale, Canoga Park, Calif. 91304
Filed May 24, 1971, Ser. No. 146,586
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



224,934
ANIMAL SHELTER
Alan E. Gilstrap, 519 Clarice Ave., Charlotte, N.C. 28204
Filed Feb. 23, 1971, Ser. No. 118,207
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

224,935
EXERCISER
Joseph A. Winger, Sarasota, Fla., assignor to Winger Enterprises, Inc., Sarasota, Fla.
Filed Nov. 26, 1969, Ser. No. 20,282
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

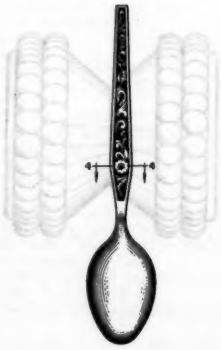
224,936
TOY XYLOPHONE
Joseph Green, Hewlett, N.Y., assignor to Joseph Green, Hewlett, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,382
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



224,937
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Apr. 30, 1971, Ser. No. 139,314
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

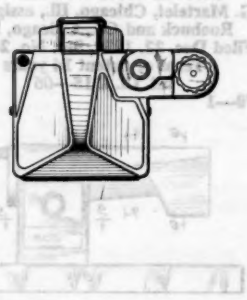
224,938
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Apr. 30, 1971, Ser. No. 139,315
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

224,939
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Apr. 30, 1971, Ser. No. 139,316
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

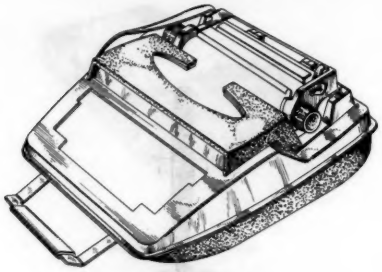


224,940
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed May 3, 1971, Ser. No. 140,018
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

224,941
EYE LEVEL VIEWFINDER FOR CAMERA
Kyusei Kanno, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Feb. 26, 1971, Ser. No. 119,451
Claims priority, application Japan Sept. 25, 1970
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

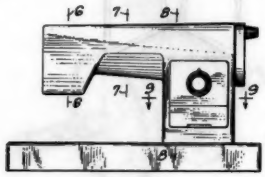


224,942
TYPEWRITER CASING
Toshiaki Funato, Nagoya, Yoshio Katsuzaki, Chita-machi, and Kazuo Ito, Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya-shi, Japan
Filed Oct. 23, 1970, Ser. No. 25,619
Claims priority, application Japan Apr. 24, 1970
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

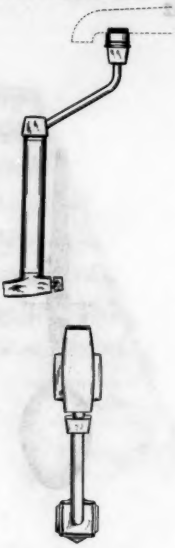


224,943
PORTABLE SEWING MACHINE
Marcel Fresard, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Sept. 8, 1970, Ser. No. 24,865
Claims priority, application Switzerland Mar. 20, 1970
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1

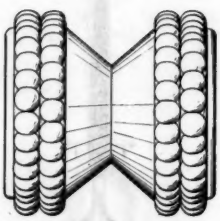
224,944
TOY SEWING MACHINE
Ronald G. Martelet, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Dec. 22, 1970, Ser. No. 26,622
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1



224,945
WHIRLPOOL BATH ATTACHMENT
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Dec. 21, 1970, Ser. No. 26,584
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1



224,946
MASSAGER
Jean De Ramel, 30 Boulevard Princesse-Charlotte, Monte-Carlo, France
Filed May 3, 1971, Ser. No. 140,011
Term of patent 7 years
Int. Cl. D24—*04*
U.S. Cl. D83—1

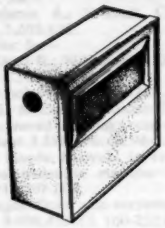


224,947

CABINET FOR MESSAGE DISPLAY PANEL

David E. Liddle, Toledo, and George W. Lambroff, Swanton, Ohio, assignors to Owens-Illinois, Inc.

Filed Dec. 22, 1970, Ser. No. 26,616
Term of patent 14 years
Int. Cl. D14—*02*; D20—*03*
U.S. Cl. D96—12

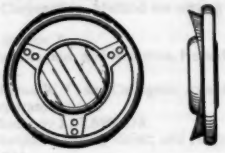


224,948

WATCH CASE

Raymond Musy, La Chaux-de-Fonds, Switzerland, assignor to S.A. Accurist, La Chaux-de-Fonds, Switzerland

Filed Oct. 19, 1970, Ser. No. 25,543
Claims priority, application Switzerland June 11, 1970
The portion of the term of the patent subsequent to July 3, 1986, has been disclaimed
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8



CABINET FOR MISSILE DISPLAY PANEL

David E. Lilette, Toledo, and George W. Tenbrink, Sylvania, Ohio, assignors to Owens-Illinois, Inc.

Filed Dec. 22, 1970, Ser. No. 29,919

Term of patent 14 years

Int. Cl. D14—02; D19—02

U.S. Cl. D86—12

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc., mesne: *See—*
Ruth, Harold C.; and Thompson, James W., 3,698,487.

Abar Corporation: *See—*
Kreider, Benjamin A.; Schmidt, Charles J.; and Martindell, Howard R., 3,698,698.

Abbott Laboratories: *See—*
Katerndahl, Dean R.; Wilson, Earl D.; Macalalad, Fidel V.; and Ring, Gene C., 3,698,396.
Ploinikoff, Nicholas Peter, 3,699,229.

Abbott, Thomas I., to Eastman Kodak Company. Diffusion transfer film unit with improved dye image receiving layer comprising a basic polymeric mordant. 3,698,896, Cl. 96-3.000.

Abe, Michio; and Maeda, Naoyuki, to Tokai Cold Forming Co., Ltd. Rotor for dynamo-electric machine of the axial airgap type. 3,699,372, Cl. 310-268.000.

Aberg, Martin Birger. Door with sections telescopically displaceable into each other. 3,698,465, Cl. 160-222.000.

Abiko, Yasushi: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.

Acorn Products Company: *See—*
DiFazio, Joseph, 3,698,883.

Acton, Edward M.; Leafer, Morris A.; and Stone, Herbert, to Stanford Research Institute. 8,9-Epoxyperillartine sweeteners. 3,699,132, Cl. 260-348.00r.

Acton Research Corporation: *See—*
Flint, Bruce K., 3,698,795.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Muscular voltage-controlled tone modifying system for electronic musical instrument. 3,699,234, Cl. 84-1.240.

Adams, Peter F.: *See—*
Kortschot, Cornelis; and Adams, Peter F., 3,698,914.

Adams, Wilbur Henry. Golden ratio playing blocks and golden rectangle frame. 3,698,122, Cl. 46-17.000.

Addie, Albert N., to General Motors Corporation. Bi-modal vehicles with drive means for external or self-propulsion. 3,699,351, Cl. 290-14.000.

Addison, William P., Jr., to Allied Products Corporation. Method of manufacture of polypropylene fabric wrapping material. 3,698,980, Cl. 156-282.000.

Addressograph-Multigraph Corporation: *See—*
Schultz, Ronald B., 3,698,895.

Adwest Engeering Limited: *See—*
Jenvey, Leslie Richard, 3,698,188.

Aero Union Corporation: *See—*
Newton, Dale P., 3,698,480.

Aerojet-General Corporation: *See—*
Grakauskas, Vytautas, 3,698,864.
Meriano, Albert P.; Fuller, Giles A.; and Knuth, William H., 3,698,507.

Aga, Takashi: *See—*
Yamanaka, Masami; and Aga, Takashi, 3,698,493.

Agence Nationale de Valorisation de la Recherch Centre Nationale D'Etudes des Telecommunications: *See—*
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Agfa-Gevaert: *See—*
Muller, Rudolf, 3,698,312.

Agfa-Gevaert Aktiengesellschaft: *See—*
Bestenreiner, Friedrich; Weiershausen, Walter; and Janovjak, Paul, 3,698,810.
Huber, Hans-Peter, 3,698,303.
Paulus, Rudolf; and Huber, Hans-Peter, 3,699,349.

Aghazadeh, Shirzad, to Singer Company, The, mesne. Digital encoding system wherein information is indicted by transition placement. 3,699,556, Cl. 340-174.10g.

Ahlfeld, Charles E.: *See—*
Baumann, Norman P.; and Ahlfeld, Charles E., 3,699,338.

Aichi Clock and Electric Implement Mfg. Co., Ltd.: *See—*
Inoue, Yutaka; Hotta, Tadao; and Ito, Toshihiko, 3,699,415.

Air Products and Chemicals, Inc.: *See—*
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A., 3,699,156.
Johnson, Glenn B.; and Petering, John L., 3,698,200.

Airco, Inc.: *See—*
Wasson, John H.; Sherry, John S.; and Kayser, John P., 3,699,235.

Aisenberg, Sol, to Whittaker Corporation. Emissivity corrected optical pyrometer. 3,698,813, Cl. 356-48.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Miyai, Masaya, 3,698,190.

Aitkenhead, William C.: *See—*
Grunig, James K.; Davis, William B.; and Aitkenhead, William C., 3,699,208.

Akashi, Tsuneo: *See—*
Tsubouchi, Norio; Takahashi, Masao; Ohno, Tomeji; and Akashi, Tsuneo, 3,699,045.

Ake, Nelson E.; and Kling, Harry C., to International Telephone and Telegraph Corporation. Method for sorting die. 3,698,976, Cl. 156-155.000.

Aktiebolaget Bofors: *See—*
Bakke, Jan Magnus; and Heikman, Harald Erik, 3,699,120.

Aku N.V.: *See—*
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Akzona Incorporated: *See—*
Castro, Anthony J., 3,699,078.
Mohr, Bernhard; Engel, Heinz; and Heijnis, James Watt Ijsbrand, 3,698,614.

Albatys, Zigmund M., to United States of America, Navy. Mortar safety device for preventing double loading. 3,698,282, Cl. 89-1.00f.

Albers, Kenneth H.; and Snapp, Thomas C., Jr., to Eastman Kodak Company. N,N-bis[2-hydroxyalkyl]2-hydroxyethoxyacetamide and process for making the same. 3,699,165, Cl. 260-561.00b.

Albertson, Robert V. Transmission belt-drive system. 3,698,256, Cl. 74-230.17e.

Albertson, Robert V. All terrain vehicle stabilizing wheels. 3,698,499, Cl. 180-6.200.

Albrecht, Hermann Friedrich; and Strauss, Karl Peter, to Rollei-Werke Franks & Heidecke. Pulse generating direct-current measuring bridges. 3,699,427, Cl. 318-674.000.

Aldrich, Ralph Edward: *See—*
Buchan, William Raymond; and Aldrich, Ralph Edward, 3,699,347.

Alexander, Alex G., to Commonwealth of Puerto Rico, The. Method of inhibiting the inversion of sucrose in sugar cane juice. 3,698,950, Cl. 127-46.00r.

Alfredsson, Alf Ingva, to Hasselblad, Fritz Victor, Dr. Viewfinder mirror mechanism for single-lens reflex cameras. 3,698,305, Cl. 95-42.000.

Allan Pump and Supply, Inc.: *See—*
Goodwin, Orval L., 3,698,367.

Allen, Herbert, to Cameron Iron Works, Inc. Extrusion press and method. 3,693,227, Cl. 72-263.000.

Allen, Lawrence E.: *See—*
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Allen, Paul T.; and Drinkard, B. M., to Mobil Oil Corporation. Separation of mixtures with modified zeolites. 3,698,157, Cl. 55-67.000.

Allied Products Corporation: *See—*
Addison, William P., Jr., 3,698,980.

Allinikov, Sidney, to United States of America, Air Force. Process for nondestructive inspection. 3,698,234, Cl. 73-15.000.

Allis-Chalmer Manufacturing Company: *See—*
Harvey, Dennis G., 3,698,504.

Allis-Chalmers Corporation: *See—*
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Allis-Chalmers Manufacturing Company: *See—*
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Allmanna Svenska Elektriska Aktiebolaget: *See—*
Berneryd, Sten; and Backskog, Hans, 3,699,289.
Hermansson, Bo; and Thorborg, Kjeld, 3,699,425.
Nilsson, Jan; and Larker, Hans, 3,698,220.

Alpers, Frederick C., to United States of America, Navy. Automatic boresighting circuit. 3,699,380, Cl. 315-21.00r.

Alphonse, Gerard Argant, to RCA Corporation. Sonic page composer for holographic memory. 3,698,794, Cl. 350-161.000.

Alps Electric Co., Ltd.: *See—*
Ohkita, Masao, 3,699,292.

Alt, Gerhard H., to Monsanto Company. N-(3-Halo-5,5 dialkylcyclohex-2-en-1-ylidene) morpholinium tetraphenyl borates. 3,699,101, Cl. 260-247.000.

Altenburger, Otto: *See—*
Neumeier, Gunter F.; and Altenburger, Otto, 3,699,263.

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Altmiller, John C.: *See—*
Cohen, Edwin; and Altmiller, John C., 3,699,244.

Altrui, Thomas N. D. Demountable contilever storage racks. 3,698,566, Cl. 211-176.000.

Ambac Industries, Inc.: *See—*
Litman, Bernard; and Silvia, Everett R., 3,698,776.
Silvia, Everett R., 3,698,251.

Ameling, Bernhard; and Kaup, Siegfried, to Thies, B., Firma. Apparatus for wet treatment of warp-rope or board-shaped textile goods. 3,698,212, Cl. 68-178.000.
American Air Filter Company, Inc.: *See*—
Gold, Harold E.; and Smith, Ralph B., 3,698,472.
American Cyanamid Company: *See*—
Fine, Leonard Wolfe; Matsuda, Ken; and Photis, James Mitchell, 3,699,164.
Firth, William Charles, Jr.; and Frank, Simon, 3,699,094.
Murray, Robert William, 3,699,077.
Shimoda, Keitaro; and Obama, Isamu, 3,698,994.
Singh, Balwant, 3,699,130.
Taylor, Arthur Sinclair; Sandhage, Ellsworth; Bott, George; and Konazewski, William, 3,698,450.
Torley, Robert Edward; and Bankert, Richard Dale, 3,699,028.
Wilson, Barrie Alexander, 3,698,853.
American Hospital Supply Corporation: *See*—
Litvinoff, James R.; and Evans, David F., 3,698,327.
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American Machine & Foundry Company: *See*—
Picek, Charles Richard; and van Hoek, Cornelis, 3,699,007.
American Metal Climax, Inc.: *See*—
Cosman, Cornelius M.; and Buker, Donald O., 3,699,213.
American Nucleonics Corporation: *See*—
Ghose, Rabindra N.; and Sauter, Walter A., 3,699,444.
American Optical Corporation: *See*—
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Hoffman, Donald O., 3,698,937.
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Amicel, Charles: *See*—
Jacquot, Michel; and Amicel, Charles, 3,698,619.
Amici, Francis Robert; Davis, Robert E.; and Levine, Richard, to Ideal Toy Corporation. Doll having adjustable lock of hair. 3,698,134, Cl. 46-135.00r.
Amoco Production Company: *See*—
Askew, Warren S.; and Marrs, Richard E., 3,698,479.
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Landrum, Ralph A., Jr., 3,698,508.
Amoroso, Michael J., to Lee-Norse Company. Mining machine having liquid supply sealing means. 3,698,769, Cl. 299-73.000.
AMP Incorporated: *See*—
Bruner, Peter Martin, 3,699,505.
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Fritz, William Baird; and Hudson, William Jeffrey, Jr., 3,699,272.
Huber, John Henry, 3,699,504.
Lockard, Joseph L.; and Rose, William Henry, 3,699,279.
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AMP Incorporated, mesne: *See*—
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Amsted Industries Incorporated: *See*—
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Analytical Instruments Limited: *See*—
Jenkins, Anthony; and Cornell, Richard Charles, 3,699,342.
Anderson, Karl R., to Thompson, John T. and Gillemot, George W. Tap shoe assembly for use with wire terminal strips. 3,699,284, Cl. 200-51.040.
Anderson, Victor F., to Shell Oil Company. Bipartite tubular molded synthetic resin furniture part with internal reinforcement. 3,698,150, Cl. 52-73.000.
Andrews, John S., to Robertson, H. H., Company. Spray generator. 3,698,695, Cl. 261-24.000.
Andrews, La Vern A.; and Muchlinski, Donald A., to Hughes Aircraft Company. System for automatic initiation of target tracking in track-while-scan radar. 3,699,573, Cl. 343-7.300.
Andrews, Laurence M.: *See*—
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, 3,698,323.
Anke, Rudolph G.; and Moyer, James D., to North American Rockwell Corporation. Pattern mechanism for knitting machines. 3,698,210, Cl. 66-155.000.
Annesser, Richard J.; and Balogh, Stephen A., to Chevron Research Company. Catalytic cracking. 3,699,037, Cl. 208-120.000.
Ansul Company, The: *See*—
Kaiser, Donald W., 3,699,167.
Anton, Franke, to Sylvania Electric Products Inc. Auxiliary lighting system for arc lamp. 3,699,382, Cl. 315-92.000.
Apod Corporation: *See*—
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Arbesman, Paul H.; James, Stanley D.; and Warburton, Donald L., to United States of America, Navy. Solid battery electrolyte and method of preparation thereof. 3,698,960, Cl. 136-153.000.
Archbold, Alice R. Pillow and method of making. 3,698,023, Cl. 5-337.000.
Arequipa Foundation: *See*—
Grassetti, Davide R.; and Murray, John F., Jr., 3,698,866.
Arima, Kei; Tamura, Gakuzo; Imanaka, Hiroshi; Kousaka, Masanobu; and Fukuda, Akio, to Fujisawa Pharmaceutical Co., Ltd. Antibiotic. 3,699,121, Cl. 260-326.900.
Arisaka, Kunio; and Takizawa, Toshikazu, to Kabushiki Kaisha Koparu. Electronic shutter for photographic camera equipped with exposure condition checking circuit and exposure time control circuit. 3,698,299, Cl. 95-10.0ct.
Armand, Walter R. Water heating attachments for automotive engine exhaust pipes. 3,698,992, Cl. 165-51.000.
Armbrust, Herbert; Sturm, Hans Juergen; Engelbach, Heinz; Wistuba, Hermann; Stoessel, Armin; and Krabetz, Richard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of anthraquinone. 3,699,134, Cl. 260-369.000.
Armstrong, Blair D., to Armstrong Store Fixture Corporation. Partition structure with adjustable end member. 3,698,568, Cl. 211-184.000.
Armstrong Store Fixture Corporation: *See*—
Armstrong, Blair D., 3,698,568.
Arnesen, Bernhard A. Hair curling device. 3,698,402, Cl. 132-37.000.
Arneson, Edwin L., to Federal Paper Board Company, Inc. Method and apparatus for packaging bottled products in basket-style carriers. 3,698,151, Cl. 53-26.000.
Arntz, Hans-Egon: *See*—
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Aronoff, Arnold, to Holiday Luggage Mfg. Co., Inc. Luggage case. 3,698,522, Cl. 190-41.00r.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
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Ashton, Harold P.; and Swett, James B., to Dart Industries, Inc. Food grater. 3,698,460, Cl. 146-180.000.
Askew, Warren S.; and Marrs, Richard E., to Amoco Production Company. Solubilized oil-water solutions suitable for miscible flooding. 3,698,479, Cl. 166-273.000.
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Atakkran, Namik, to Appleton Electric Company. Linear push plunger electrical switch with tubular shrovel arc prevention means. 3,699,276, Cl. 200-16.00a.
Ateliers de Constructions Electriquer de Charleroi (ACEC): *See*—
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Ather, Roy L.: *See*—
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Hoffman, Robert N.; and Kern, Loyd R., 3,698,491.
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Sweet, Ervin J.; Doyle, Brian W.; and Rygelis, Joseph, 3,698,743.
Avery, Julian Miles. Metallothermic production of magnesium. 3,698,888, Cl. 75-67.000.

Avrillon, Rene; Franckowiak, Sigismond; Gatellier, Claude; and Glikmans, Georges, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for cultivating micro organisms in the presence of hydrocarbons. 3,698,998, Cl. 195-28.000.

Azud, Robert E.: *See—*
Holland, William P.; and Azud, Robert E., 3,699,373.

Babson, Arthur L., to Warner-Lambert Company. Filtering pipette. 3,698,561, Cl. 210-445.000.

Backskog, Hans: *See—*
Berneryd, Sten; and Backskog, Hans, 3,699,289.

Bacskai, Robert, to Chevron Research Company. Nitorgen-containing *p*-tert-butylstyrene copolymers in lubricant compositions. 3,699,043, Cl. 252-50.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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Bahlberg, Reinhard, to Telefunken Patentverwertungsgesellschaft m.b.H. Method of producing a planar-transistor. 3,698,077, Cl. 29-578.000.

Bahnsen, Erwin B., to Steiner American Corporation. Continuous washing apparatus. 3,698,214, Cl. 68-205.00r.

Bailey, Jay Richard: *See—*
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Baker Perkins Limited: *See—*
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Baker, Ronald E.; Fogarty, Robert L.; and Slagel, Edwin C., to Goodyear Aerospace Corporation. Self sealing composite. 3,698,587, Cl. 220-9.00f.

Baker, William; Worrell, Clyde; and Banzhaf, Donald Howard. Composite beam structure and assembly. 3,698,149, Cl. 52-731.000.

Bakke, Jan Magnus; and Heikman, Harald Erik, to Aktiebolaget Bofors. Method of producing indole. 3,699,120, Cl. 260-319.100.

Baksay, Ivan. Reducing tube-wall eccentricity in tube intermediates. 3,698,229, Cl. 72-341.000.

Baldwin, Edwin C., Jr.; and Wrenner, Warren R., to International Business Machines Corporation. Electron beam deflection control method and apparatus. 3,699,304, Cl. 219-121.0eb.

Balke, Rodney Worth; Lynn, Robert Reed; and Wernicke, Rodney Keith, to Textron, Inc. Rotary wing pylon mounting system. 3,698,663, Cl. 244-17.270.

Ballast-Nedam Groep N.V.: *See—*
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Ballenger, William C., to Central Specialties Co. Cord storage reel assembly. 3,698,656, Cl. 242-106.000.

Ballentine, John W.; and Chaffin, Frank R., to Shambon, W. S., & Co. Lead screw and nut. 3,698,257, Cl. 74-424.80r.

Ballymore Company: *See—*
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Balogh, Stephen A.: *See—*
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Ban, Itsuki. Control circuit for multiple tape cartridge playing apparatus. 3,698,722, Cl. 274-4.00f.

Bankert, Richard Dale: *See—*
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Hindle, Thomas; and Banks, David Dugmore, 3,698,444.

Banks, Neill K., Jr.; and Standley, Mark L., to Bomco, Incorporated. Tire rim assembly. 3,698,463, Cl. 152-379.000.

Banning, J., Aktiengesellschaft: *See—*
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Banzhaf, Donald Howard: *See—*
Baker, William; Worrell, Clyde; and Banzhaf, Donald Howard, 3,698,149.

Baptista, John L.; Rauner, Frederick J.; and Ford, John A., Jr., to Eastman Kodak Company. Organosilicon polymeric dyes. 3,699,135, Cl. 260-375.00b.

Baranowski, Frank, Jr. Fluid flow control valve. 3,698,427, Cl. 137-542.000.

Barber, Warren A., to Singer Company, The. Circuits for controlling solenoid energization to reduce heating. 3,699,399, Cl. 317-148.50b.

Barnett, Howard James. Movement responsive alarm system for a vehicle. 3,699,515, Cl. 340-65.000.

Baron, Henry J. Hydrophilic lens. 3,698,802, Cl. 351-160.000.

Barone, Frank J.; and Tolliver, Donald L., to Motorola, Inc. Fabrication of a silicon-silicon dioxide interface of predetermined space charge polarity. 3,698,948, Cl. 117-213.000.

Barr and Stroud, Limited: *See—*
Berry, Peter John, 3,698,790.

Barr, Robert Alan, to Midland Ross Corporation. Extruder, or extruder-like melting apparatus. 3,698,541, Cl. 198-214.000.

Barra, Donald P. Analog system of music notation. 3,698,277, Cl. 84-483.000.

Barrett, George M. Low pollution heat engine. 3,698,184, Cl. 60-36.000.

Barry, Walter D. Kite parachute unit with automatic ejector. 3,698,671, Cl. 244-155.00r.

Bartlett, Peter G.: *See—*
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Batts, John H., to Batts, John Thomas, Inc. Garment clamping hanger. 3,698,607, Cl. 223-96.000.

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Baucom, Keith K., to Baxter Laboratories, Inc. Recipient identification. 3,698,383, Cl. 128-2.00g.

Bauer, Lieselotte: *See—*
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Bauer, Ralf, to Veb Warnowwerft. Roll-back closure assembly for large openings, especially for hatch openings of ships. 3,698,346, Cl. 114-201.000.

Baum, Wilhelm; and Gierlichs, Michael, to Henkel & Cie G.m.b.H. Free flowing powder containing confectioners sugar. 3,698,917, Cl. 99-141.000.

Bauman, Ronald M. High isolation A.C. to D.C. converter. 3,699,426, Cl. 321-27.00r.

Baumann, Norman P.; and Ahlfeld, Charles E., to United States of America, Atomic Energy Commission. Oscillating monitor for fissile material. 3,699,338, Cl. 250-83.100.

Bausch & Lomb Incorporated: *See—*
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Baxter Laboratories, Inc.: *See—*
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Beach, Sidney C.; and Martin, Bernard P., to Inorganic & Metal Treating Chemicals Division. Bright nickel plating bath and process. 3,699,016, Cl. 204-49.000.

Beane, David J.; and Gastler, John H., to United Aircraft Corporation. Afterburner combustion apparatus. 3,698,186, Cl. 60-39.72r.

Beatrice Foods Co.: *See—*
Young, Edward G., 3,698,032.

Beauchamp, Robert Owens, Jr.; Ward, John Wesley; and Franko, Bernard Vincent, to Robins, A. H., Company, Incorporated. Dimethylisosorbide solvent for muscle relaxant drugs. 3,699,230, Cl. 424-272.000.

Beaver, Robert D., to Koontz Machine & Welding, Inc. Hydraulically operated winch. 3,698,690, Cl. 254-186.000.

Bechtold, George W.; Derr, Vernon F.; and Wiltse, James C., to United States of America, Army. Method and apparatus for generating third harmonic signals. 3,699,353, Cl. 307-88.300.

Beck, Edward G., Jr., to Stolle Corporation, The. Flat sheet of metal having an elongated member secured thereto. 3,698,475, Cl. 165-171.000.

Beck, Merril G., to Lord Corporation. Composite leaf spring. 3,698,702, Cl. 267-47.000.

Beck, Walter: *See—*
Osberg, Edward V.; and Beck, Walter, 3,699,173.

Becker, Franz, to Dynamit Nobel Aktiengesellschaft. Non-metallic mine pressure fuse. 3,698,315, Cl. 102-8.000.

Beckman Instruments, Inc.: *See—*
Stahl, Lawrence E.; and Gropper, Lee, 3,699,287.

Beebe, Harwood, Jr. Guide for watching sports. 3,698,741, Cl. 283-63.000.

Beemsterboer, George L.: *See—*
Tapp, James S.; Beemsterboer, George L.; and Salyer, Ival O., 3,698,560.

Beguin, Daniel Edmund, to International Standard Electric Corporation. Phase correction apparatus for circular polarization operation monopulse antenna horn. 3,699,583, Cl. 343-756.000.

Begy Societe Europeenne de Bas sans Couture: *See—*
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Behrens, Burkhard; and Delius, Hermann, to Reichhold-Albert-Chemie Aktiengesellschaft. Photopolymerizable unsaturated polyesters containing benzoin-ether, organic acid ester, organic phosphine initiators. 3,699,022, Cl. 204-159.150.

Beldon, Roy A.: *See—*
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Belgau, Frank A. Visual and audio perception testing and training apparatus. 3,698,800, Cl. 351-32.000.

Bell & Howell Company: *See—*
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Dann, Bert H., 3,699,243.
Hull, Charles W.; and McKinney, Charles R., 3,699,332.
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Bell, Harry F.; Lazzarini, Donald J.; and Schultz, Lewis K. Anti-corrosive electrophoretic coating process. 3,699,029, Cl. 204-181.000.

Bell Telephone Laboratories, Incorporated: *See—*
Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, 3,699,271.
Copeland, John Alexander, III, 3,699,548.
De Fabritis, Raymond P.; Fefferman, Gerald Burt; Gesner, Bruce David; and Radner, Raymond John, 3,699,552.
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Hart, Harry Patrick; Kakalec, Robert John; and Walk, Ralph, 3,699,424.
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Bellinger, S. Lawrence, to Mowbot Inc. Self-propelled random motion lawnmower. 3,698,523, Cl. 192-12.0ba.

Belson, Henry S.; De Savage, Bernard F.; and Tebble, Robert S., to United States of America, Navy. Nondestructive readout thin film memory device and method therefor. 3,699,553, Cl. 340-174.0tf.

Benckiser, Joh. A., GmbH Chemische Fabrik: *See—*
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McGinnis, Patrick F., 3,699,330.
Meunier, Joseph R. J.; and Wieg, Heinrich J., 3,699,560.
Mueller, Rolf K.; and Emanuel, Marom, 3,698,787.
Philippe, Nicodeme, 3,699,513.
Putt, James Basil, 3,699,561.
Sulich, Janusz S., 3,698,413.
Vasek, Anthony G., 3,698,248.
Wolber, William G., 3,698,789.

Benkeser, Robert A.; and Smith, William E., to Purdue Research Foundation. Novel process for making halosilyl carbon compounds and novel halosilyl carbon compounds produced thereby. 3,699,141, Cl. 260-448.20r.

Benkeser, Robert A.; and Smith, William E., to Purdue Research Foundation. Bis (halosilyl) organic compounds and process of making same. 3,699,142, Cl. 260-448.20r.

Benkeser, Robert A.; and Gaul, James M., to Purdue Research Foundation. Novel process for the manufacture of halosilyl organic compounds and novel products made thereby. 3,699,143, Cl. 260-448.20r.

Bennett, Michael Camm, to Tate & Lyle Limited. Sugar refining. 3,698,951, Cl. 127-48.000.

Bennett, Richard L., to Perkins Research & Mfg. Co. Apparatus for identifying telephone cable pairs. 3,699,274, Cl. 179-175.000.

Benton, Elton J.: *See—*
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Bentsen, Per: *See—*
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Berenbaum, Arthur; and McDonough, Rort M., to Philco-Ford Corporation. Bi-directional operating mechanism. 3,699,453, Cl. 325-397.000.

Berezentsev, Jury Sergeevich: *See—*
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Berg, Robert H. Average volume digital computer and digital volume totalizer for cells and particles. 3,699,319, Cl. 235-151.340.

Berger, Frank M.: *See—*
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Berges, Wilhelm. Friction lining for brakes, clutches and like apparatus. 3,698,526, Cl. 192-107.00m.

Berggren, Albin F., Jr.: *See—*
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Bergh Bros. Co., Inc.: *See—*
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Bergh, George G.; and Bergh, Robert G., to Bergh Bros. Co., Inc. Method of fabricating a covered box construction. 3,698,291, Cl. 93-5.0yr.

Bergh, Robert G.: *See—*
Bergh, George G.; and Bergh, Robert G., 3,698,291.

Bergwerksverband GmbH: *See—*
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Bergy, Malcolm E.; Hoeksema, Herman; and Johnson, Le Roy E., to Upjohn Company, The. Enhygrofungin and process for preparing the same. 3,699,223, Cl. 424-121.000.

Berkel G.m.b.H.: *See—*
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Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, to Bell Telephone Laboratories, Incorporated. Speech processor using multiband controlled center clipping. 3,699,271, Cl. 179-170.800.

Berkovits, Rarouh V., to American Optical Corporation. Pate-scanning pacer for treatment of tachycardia. 3,698,398, Cl. 128-422.000.

Berlincourt, Don A., to Vernitron Corporation, mesne. Width extensional resonator and coupled mode filter. 3,699,484, Cl. 333-72.000.

Berner, Warren E., to General Electric Company. Process for forming low impedance ohmic attachments. 3,698,080, Cl. 29-583.000.

Berneryd, Sten; and Backskog, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Operating device for electric switching apparatus for high voltage. 3,699,289, Cl. 200-148.00r.

Bernhardt, Daniel W.: *See—*
Jones, Lewis E.; and Bernhardt, Daniel W., 3,699,278.

Bernin, Victor M., to Illinois Tool Works, Inc. Solid state switch. 3,698,531, Cl. 197-98.000.

Berning, Eugene B.; and Holmes, John E. Solenoid actuated valve for anhydrous ammonia flow meters. 3,698,682, Cl. 251-30.000.

Berry, James I., to Ford Motor Company. Electronic sensor for developing a voltage signal proportional in magnitude to displacement. 3,698,250, Cl. 73-517.000.

Berry, Peter John, to Barr and Stroud, Limited. Stabilised optical systems. 3,698,790, Cl. 350-16.000.

Bertea Corporation: *See—*
York, Ray A., 3,698,264.

Bertele, Erhard; and Schudel, Peter, to Givaudan Corporation. Process for preparation of terpene flavorants. 3,699,169, Cl. 260-604.00r.

Bertele, Ludwig, 1/2 to Wild Heerbrugg AG, Firma. Objective consisting of five lens members. 3,698,796, Cl. 350-216.000.

Bertin & Cie: *See—*
Croix-Marie, Francis Marie Jean, 3,698,506.

Berwin, Zoited W., to Hughes Aircraft Company. Resonant sweep generator. 3,699,356, Cl. 307-228.000.

Bestenreiner, Friedrich; Weiershausen, Walter; and Janovjak, Paul, to Agfa-Gevaert Aktiengesellschaft. Method and arrangement for manufacturing diffusion lenses of arbitrary indicatrix. 3,698,810, Cl. 355-71.000.

Bevington, William J., to Clow Corporation. Axially locked pipe joint. 3,698,744, Cl. 285-111.000.

Bewley, Henry Dale, to United States of America, Atomic Energy Commission. Aluminum alloy. 3,698,890, Cl. 75-147.000.

Beyers, Billy Wesley; and Tretter, Larry Lee Roy, to RCA Corporation. Communication among computers. 3,699,529, Cl. 340-172.500.

Bielefeld, Ewald J., Jr.; and Puma, Maurice J., to General Dynamics Corporation. Method of analyzing and controlling etchant solution concentrations. 3,698,867, Cl. 23-230.00a.

Big George, Inc.: *See—*
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Bilichniansky, Theodore, to Technicon Instruments Corporation. Dispenser for supplying liquid by suction. 3,698,868, Cl. 23-23.0or.

Bills, Charles Tyler: *See—*
Yurcick, Peter A.; and Bills, Charles Tyler, 3,698,935.

Binham, Glenn: *See—*
Leatherman, Ralph W., 3,699,285.

Binning, Robert C.; Parts, Leo P.; Peresie, Robert J.; and Rodenburg, Margaret L., to Monsanto Research Corporation. Method of graphitizing fibers. 3,699,210, Cl. 23-209.300.

Bixler, Kenneth D., to Diamond International Corporation. Open bottom meat container. 3,698,623, Cl. 229-2.500.

Blachere, Robert; and Sauvage, Michel, to Commissariat a l'Energie Atomique. Sealing device. 3,698,724, Cl. 277-34.300.

Black and Decker Manufacturing Company, The: *See—*
Wood, John W., 3,699,366.

Black Clawson Company, The: *See—*
Bowker, John F.; and Odegard, Warren H., 3,698,818.
Herbert, William, 3,698,649.

Black, Svalls & Bryson, Inc.: *See—*
Wood, Loren E.; and Free, Marvin H., 3,698,598.

Black, Thomas J.; and Schmitt, Werner H., to Westermann, Werner F. Coin sorting and conveying apparatus. 3,698,537, Cl. 198-33.0aa.

Blackstock, Thomas A., to United States of America, National Aeronautics and Space Administration. Ferry system. 3,698,659, Cl. 244-1.0ss.

Blair, Lloyd R.: *See—*
Martin, Gregory L.; and Blair, Lloyd R., 3,699,448.

Blake, Darrell N. Perforating machine. 3,698,222, Cl. 72-129.000.

Blake, Graham John: *See—*
Flint, John Anthony; and Blake, Graham John, 3,699,068.

Blakeslee, Kenneth L. Electronic sequential switch. 3,699,390, Cl. 317-16.000.

Blatt, LeLand Francis; and Wiesenhofer, Frank Henry. Safety silencer air nozzle. 3,698,510, Cl. 181-36.00a.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See*—
Eibe, Werner W., 3,698,226.

Bleh, Otto: *See*—
Termin, Erich; and Bleh, Otto, 3,699,137.

Bleha, William P., Jr.: *See*—
Scholl, Ronald F.; and Bleha, William P., Jr., 3,699,374.

Bliss, E. W., Company: *See*—
Hill, Frank W.; Bartlett, Peter G.; and Clark, Larry K., 3,699,512.

Blohm & Voss AG: *See*—
Krakow, Heinz; and Niedorf, Carl, 3,698,622.

Blome, Eugene R., to Fairchild Camera and Instrument Corporation. Multilayer antireflective absorption film. 3,698,928, Cl. 117-45.000.

Blomgren, Evert: *See*—
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, 3,698,323.

Blonsky, Joseph E., to American Pulpwood Association. Tree harvesting device and method. 3,698,457, Cl. 144-34.00r.

Bloomfield, Harold; and Roberts, Melvin F., to Bloomfield Industries, Inc. Utility wheel-bearing carts. 3,698,735, Cl. 280-47.350.

Bloomfield Industries, Inc.: *See*—
Bloomfield, Harold; and Roberts, Melvin F., 3,698,735.

Bochinski, Julius H.; and Linkel, John E., to North American Rockwell Corporation. Hot gas fusion process and apparatus. 3,698,699, Cl. 266-5.00r.

Bochinski, Julius H., to Enviro Control, Inc. Conductive fluid content detection system. 3,699,559, Cl. 340-236.000.

Bodey, Charles E.; and Cook, Robert G. Submerged pin for moving and submarine under water. 3,698,197, Cl. 61-46.000.

Boehlert, Marjorie A. Disposable feeding dish and its complementary recepticle. 3,698,594, Cl. 220-63.000.

Boeing Company, The: *See*—
Cole, James B., 3,698,668.
Lang, John M.; and Trautman, Robert D., 3,698,679.

Boersma, Sipko L.: *See*—
Hendley, Dennis Alfred; and Boersma, Sipko L., 3,699,558.

Bokeky, Edward Joseph, III, to RCA Corporation. Fusible semiconductor device including means for reducing the required fusing current. 3,699,403, Cl. 317-235.00r.

Boleky, Edward Joseph, to RCA Corporation. Semiconductor device including fusible elements. 3,699,395, Cl. 317-101.000.

Bolger, Bernard J.: *See*—
O'Sullivan, Denis J.; and Bolger, Bernard J., 3,699,127.

Bolton, Lawrence. Rear view mirror for auto bumpers. 3,698,798, Cl. 350-307.000.

Bombardier, Jerome, to Bombardier Limited. Variable speed transmission system and braking means. 3,698,497, Cl. 180-5.00r.

Bombardier Limited: *See*—
Bombardier, Jerome, 3,698,497.

Bomco, Incorporated: *See*—
Banks, Neill K., Jr.; and Standley, Mark L., 3,698,463.

Bonleitner, Wolfgang; Chvatlinsky, Kurt; and Hanke, Walter, to Olympia Werke Aktiengesellschaft. Case shift control apparatus operable by a case shift key and by type keys. 3,698,530, Cl. 197-71.000.

Bonney, Kenneth Victor, to Hawker Siddeley Aviation Limited. Aircraft. 3,698,664, Cl. 244-42.0da.

Boom, Abraham A., to Celanese Corporation. Production of improved semipermeable polybenzimidazole membranes. 3,699,038, Cl. 210-23.000.

Boome, Martin W. Boat hull. 3,698,343, Cl. 114-66.50p.

Boone, Jerry C.; and Allen, Lawrence E., to Allis-Chalmers Manufacturing Company. Automatic header height control sensed from floating crop engaging mechanism. 3,698,164, Cl. 56-10.400.

Boots, Patrick R.; and Gaddis, Kenneth W., to Scope Lock, Inc. Vehicle parking space locking device. 3,698,135, Cl. 49-35.000.

Borden Company, The: *See*—
Leeks, Robert Ernest; and Demers, Alfred John, 3,698,933.

Borenstein, Martin. Sling type upholstered furniture. 3,698,766, Cl. 297-441.

Borg-Warner Corporation: *See*—
Distefano, John F., 3,698,839.
Nixon, James E., 3,698,772.

Borzoni, John J.; Swichard, Edward A.; and Burek, John A., Jr. Fuse holder assembly. 3,699,500, Cl. 339-91.00r.

Bosch, Robert, G.m.b.H.: *See*—
Maylandt, Helmut; Forster, Herbert; and Juhasz, Josef, 3,699,410.
Niemann, Gert, 3,698,961.
Reger, Herbert; and Heinrich, Hans-Walter, 3,698,542.

Bossert, Norman K. Golf cart seat. 3,698,738, Cl. 280-150.00r.

Bossmann, Clifford W.; Kaufmann, Harland A.; and Mathes, Charles E., to National Cash Register Company, The. Method for producing a set of control detents for a business machine. 3,698,069, Cl. 29-407.000.

Bott, George: *See*—
Taylor, Arthur Sinclair; Sandhage, Ellsworth; Bott, George; and Konazewski, William, 3,698,450.

Boucek, Miroslav; and Jiskra, Miroslav, to Vyzkumny Ustav Bavlnarsky. Spinning machine and method of operating the same. 3,698,174, Cl. 57-58.950.

Bouclin, Peter, to United States of America, Navy. Vibroacoustic test method. 3,698,241, Cl. 73-69.000.

Boussois Souchon Neuvesel: *See*—
Jacquot, Michel; and Amicel, Charles, 3,698,619.

Bowers, Thomas S., to Hansen, A. L., Mfg. Co. Load holding device. 3,698,678, Cl. 248-361.000.

Bowker, John F.; and Odegard, Warren H., to Black Clawson Company, The. Log diameter scanner including a plurality of photodetectors. 3,698,818, Cl. 356-160.000.

Bowles, Arnold G.; and Follette, Neil, to National Forge Company. High production isostatic molding device. 3,698,843, Cl. 425-86.000.

Bowling, Clarence C. Containers for fixing, holding, and storage of dead insect specimen. 3,698,101, Cl. 35-20.000.

Boyer, Jackson S.: *See*—
Mills, Ivor W.; Dimeler, Glenn R.; Kirk, Merritt C., Jr.; and Boyer, Jackson S., 3,699,071.

Boyle, Donald Francis, to Motorola, Inc. Ultrasonic metallic sheet-frame bonding. 3,698,075, Cl. 29-470.100.

Boyle, John P.; Murphy, Clarence R.; and Walsh, William L., to Gulf Research & Development Company. Hydrobromination of alpha-olefins. 3,699,179, Cl. 260-663.000.

Boyles, Elmo N., to Disco Industries, Inc. Disc brake apparatus. 3,698,518, Cl. 188-72.500.

Braden, William D.; Marshall, Richard P.; Greenhorn, Richard J.; and Buser, Arnold S., to Goodyear Tire & Rubber Company, The. Apparatus for processing cured tires. 3,698,233, Cl. 73-1.00b.

Bradie, Peter R.: *See*—
Hodge, Thomas, Jr.; and Bradie, Peter R., 3,699,564.

Bradt, Gordon E., to Bell & Howell Company. Power transmission mechanism. 3,698,254, Cl. 74-143.000.

Brady, Donnie G., to Phillips Petroleum Company. Synthesis of allyl esters with palladium and platinum halide catalysts. 3,699,155, Cl. 260-491.000.

Brady, W. H., Co.: *See*—
Hueser, Elliott G.; and Muttera, William H., Jr., 3,698,296.

Brandstrom, Arne Elof: *See*—
Gagneun, Andre; Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingomar, 3,699,124.

Brandt, Oscar E.; and Harris, Joseph G., to Lockheed Aircraft Corporation. Explosive system. 3,698,281, Cl. 89-1.00b.

Branson Instruments, Incorporated: *See*—
Jacke, Stanley E., 3,698,408.

Brawn, Philip E., to Carothers Sheet Metal Company. Veneer stacker. 3,698,708, Cl. 271-74.000.

Brawner, William H.: *See*—
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.

Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 14% each to Summer, Dale E., Rockwell, Lowell K., Rogers, Paul C., Laznibat, Nick A., Gunsalus, Claude A., 13% to Brawner, William H., 5% each to Kimmich, Gordon R., Plourde, Leonard J., Mcuire, Marcus W. and 2% to Smyth, George F. Can bodies and method and apparatus for manufacture thereof. 3,698,337, Cl. 113-120.0aa.

Brechbuhler, Hans Ulrich: *See*—
Gubler, Kurt; Meyer, Urs; and Brechbuhler, Hans Ulrich, 3,699,225.

Brefka, Paul E.: *See*—
Danti, Bernard R.; and Brefka, Paul E., 3,699,291.

Brendt, Dieter; Helms, Gerd; and Keunecke, Gerhard, to Chemiebau Dr. A. Zieren GmbH & Co. KG. Process for the purification of crude phthalic anhydride by plural stage vacuum distillation with side stream product recovery. 3,699,008, Cl. 203-72.

Brennan, George Andrew. Air pollution detectors. 3,698,871, Cl. 23-254.00r.

Brents, J. W. Anchor device for door frames. 3,698,146, Cl. 52-214.000.

Breslow, Jeffrey D., to Glass, Marvin, & Associates. Projectile displacing apparatus including stressible strands and missiles. 3,698,714, Cl. 273-119.00r.

Bresser, Robert E.: *See*—
Hechenbleikner, Ingenuin A.; Hussar, John F.; Koeniger, Arthur F.; and Bresser, Robert E., 3,699,152.

Briar, John R.: *See*—
Schlotterbeck, David L.; and Briar, John R., 3,698,204.

Bridgestone Tire Company, Limited: *See*—
Ogata, Nobuo, 3,699,204.

Briody, Thomas F., to Western Electric Company, Incorporated. Methods and apparatus for heating and/or coating articles. 3,699,298, Cl. 219-10.490.

British American Oil Company Limited, The: *See*—
Pogorski, Louis A., 3,698,588.

British Iron and Steel Research Association, The: *See*—
Reed, Geoffrey R., 3,698,152.

British Steel Corporation: *See*—
Smith, Henry, 3,698,757.

Brixius, Jacob K.; Takacs, Lawrence M.; and Van Sweringen, James P., to North American Rockwell Corporation. Filter. 3,698,161, Cl. 55-493.000.

Brock, James, to Imperial Chemical Industries Limited. Pneumatic device for forwarding filamentary material. 3,698,612, Cl. 226-91.000.

Brougham, George D. Archery bow with arrow support structure. 3,698,375, Cl. 124-24.000.

Brown, Harry H.: *See*—
United States of America, National Aeronautics and Space Administration, 3,698,385.

Brown, Ray B.; Fluhr, Frederick R.; and Hall, George L., to United States of America, Navy. Laser output attenuator. 3,698,797, Cl. 350-266.000.

Brown, Robert G.: *See—*
Iliff, Walter R.; Holt, John M.; Chadima, George E.; and Brown, Robert G., 3,699,324.

Brown, Robert G. Dextran hydrolizing enzymes. 3,699,002, Cl. 195-66.

Brown, Terry D.: *See—*
Wood, Harold V.; and Brown, Terry D., 3,699,087.

Brown, Thomas W. Fence barb arm. 3,698,691, Cl. 256-11.000.

Brown, Verne R., to Environment Metrology Corporation. Electrical shock hazard detection system with station scanning and indicating means. 3,699,432, Cl. 324-51.000.

Browning, Stanley Albert Charles; and Williams, Glen, to Canadian Imperial Bank of Commerce. Collapsible hockey goal. 3,698,715, Cl. 273-127.00b.

Browning, William C.; and Chesser, Billy G., to Milchem Incorporated. Drilling fluid composition and process for drilling subterranean wells. 3,699,042, Cl. 252-8.50c.

Brozovich, John C.: *See—*
Emmett, Robert C., Jr.; Dahlstrom, Donald A.; and Brozovich, John C., 3,698,556.

Bruckmann, Andre: *See—*
Fleurquin, Yves; and Bruckmann, Andre, 3,698,930.

Bruckner, Kurt, to Bruckner-Apparatebau Michelstadt GmbH. Treatment of continuous fabric webs. 3,698,024, Cl. 8-151.000.

Bruckner-Apparatebau Michelstadt GmbH: *See—*
Bruckner, Kurt, 3,698,024.

Bruner, Peter Martin, to AMP Incorporated. Staked tab terminal. 3,699,505, Cl. 339-221.00r.

Brunner, Adolf, to Semperit Osterreichisch-Amerikanische Gummiwerke A.G. Sandals and methods and machines for their manufacture. 3,698,108, Cl. 36-11.500.

Brunswick Corporation: *See—*
Nunes, John; and Martin, Albert D., 3,698,963.
Roberts, John A.; and Roberts, Peter R., 3,698,863.

Bryant, Michael I.; and Jones, Charles E., to Burlington Industries, Inc. Method of improving the adhesion of glass cloth to rubber. 3,698,983, Cl. 156-308.000.

Bryden, Brian Richard, to Northern Electric Company Limited. Subnanosecond pulse generator circuit. 3,699,361, Cl. 307-273.000.

Bryzinski, Thaddeus F.; and Martin, Joseph F., to Stromberg-Carlson Corporation, mesne. Filamentary magnetic memory with electrostatic shielding. 3,699,549, Cl. 340-174.00s.

Buchan, William Raymond; and Aldrich, Ralph Edward, to Itek Corporation. Variable electro-optic filter and readout apparatus. 3,699,347, Cl. 250-217.00r.

Buchanan Electrical Products Corporation: *See—*
Ustin, Martin D., 3,699,283.

Buchel, Kurt: *See—*
Schwab, Johann; Buchel, Kurt; Eder, Otto; Hascic, Wladimir; and Marek, Ludwig, 3,698,027.

Buck, Willard E.; Herbold, Robert J.; and Sherman, Randy J., to Technical Operations Incorporated. Cooling and lubrication for high speed rotating systems. 3,698,514, Cl. 184-6.400.

Buerki, Christian E., to Norris Industries Inc. System for detecting safety switch failure. 3,699,300, Cl. 219-10.550.

Buescher, William E.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Electron discharge device thermionic cathode having reduced operating temperature and method of making same. 3,699,378, Cl. 313-346.0dc.

Buker, Donald O.: *See—*
Cosman, Cornelius M.; and Buker, Donald O., 3,699,213.

Bullard, Terry S. Floating body amusement device. 3,698,711, Cl. 273-1.001.

Bungardt, Karl; Dietrich, Hermann; Lennartz, Gustav; and Arntz, Hans-Egon, to Deutsche Edelstahl-Werke Aktiengesellschaft. Non-Magnetisable steel. 3,698,889, Cl. 75-123.000.

Bunker-Ramo Corporation, The: *See—*
Hohenberg, Reiner Mathias; and Knitter, Heinz, 3,699,280.

Buntin, Henry J. Swimming, teaching and training aid. 3,698,026, Cl. 9-308.000.

Bunting, Earl L., to Bunting Steri Systems, Inc. Process and signal distributing system and apparatus used therein. 3,699,250, Cl. 178-6.800.

Bunting Steri Systems, Inc.: *See—*
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Burek, John A., Jr.: *See—*
Borzoni, John J.; Swichard, Edward A.; and Burek, John A., Jr., 3,699,500.

Burke, Jack J.; and Guillot, Joseph M., Jr., to Collins Radio Company. Bonding apparatus. 3,698,621, Cl. 228-4.000.

Burke, William F. Tank for liquid fuel. 3,698,597, Cl. 220-86.000.

Burlington Industries, Inc.: *See—*
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Burns, Eugene A.: *See—*
Lubowitz, Hyman R.; Kendrick, William P.; Jones, John F.; and Burns, Eugene A., 3,699,074.

Burroughs Corporation: *See—*
Caras, Bernard, 3,699,376.
Carlson, Carl B.; McKeeman, William M.; and Price, William C., 3,699,528.
Ekstrand, James, 3,698,821.
Kruklitis, Karlis, 3,699,430.

Burrows, Clinton A., Jr. Modular fence construction. 3,698,692, Cl. 256-19.000.

Bus & Car Company S.A.: *See—*
Scheitel, Neal W., 3,698,464.

Buser, Arnold S.: *See—*
Braden, William D.; Marshall, Richard P.; Greenhorn, Richard J.; and Buser, Arnold S., 3,698,233.

Buske, Ervin. Pulling post base. 3,698,230, Cl. 72-386.000.

Butler, Kenneth; Conover, Lloyd H.; and Woodward, Robert B., to Pfizer Inc. 2-[(5'-(3'-and/or 4'-substituted) isoxazolyl) aminomethyl]-3,4,10-trioxo-1,2,3,4,4,9,9,. 3,699,117, Cl. 260-307.500.

Caldwell, Deane B. Homopolar generator. 3,699,370, Cl. 310-178.000.

Calhoon, Audra M.: *See—*
Gier, Delta W.; and Calhoon, Audra M., 3,699,232.

Calmon, Calvin; Heit, Allyn Harold; and Helfgott, Theodore. Method for the removal of colloidal suspensions and other pollutants from liquid wastes. 3,699,039, Cl. 210-28.000.

Cambridge Filter Corporation: *See—*
Goulet, Roger T.; and Zednik, Ernest R., 3,698,984.

Cameli, Nazzareno: *See—*
Carbonaro, Antonio; Greco, Alberto; Asta, Gino Dall; and Cameli, Nazzareno, 3,699,088.

Cameron Iron Works, Inc.: *See—*
Allen, Herbert, 3,698,227.

Campbell, Frederick: *See—*
MacDonald, Eric; and Campbell, Frederick, 3,698,908.

Campbell, Mark E., to North American Rockwell Corporation. Fingerprint analysis device. 3,699,519, Cl. 340-146.30e.

Campbell, William G., to Hurst Performance Inc. Rod forming process and apparatus. 3,698,228, Cl. 72-306.000.

Canadian Cane Equipment Ltd.: *See—*
Tilby, Sydney E., 3,698,459.

Canadian General Electric Company Limited: *See—*
Eastcott, Peter de Hertel; and Welch, James Ernest, 3,698,750.

Canadian Imperial Bank of Commerce: *See—*
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Canadian National Railway Company: *See—*
Cass, George R., 3,699,563.

Canadian Safety Fuse Company Limited: *See—*
Welsh, David Martin, 3,698,280.

Canadn Patents and Development Limited: *See—*
Schreiber, Kurt, 3,698,133.

Canizares, Luis. Game simulating a bullfight. 3,698,717, Cl. 273-134.0ag.

Cann, Peter L.; and Duell, Richard J., to Carrier Corporation. Centrifugal fan. 3,698,833, Cl. 415-201.000.

Capowski, Robert S.; Unterberger, Robert M.; and Horsman, Larry R., to International Business Machines Corporation. Input/output system with dedicated channel buffering. 3,699,530, Cl. 340-172.500.

Caprara, Giuseppe: *See—*
Messina, Giuseppe; Montorsi, Giorgio; and Caprara, Giuseppe, 3,699,133.

Caras, Bernard, to Burroughs Corporation. Keep-alive electrode for display panel. 3,699,376, Cl. 313-197.000.

Carbonaro, Antonio; Greco, Alberto; Asta, Gino Dall; and Cameli, Nazzareno, to Goodrich, B. F., Company, The. Copolymers of polycyclic dienes. 3,699,088, Cl. 260-79.50b.

Carl Zeiss-Stiftung; a/b/a Carl Zeiss: *See—*
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Carlisle Chemical Works, Inc.: *See—*
Hechenbleikner, Ingenuin A.; Hussar, John F.; Koeniger, Arthur F.; and Bresser, Robert E., 3,699,152.

Carlson, Arthur, Jr., to Haver-Lockard Laboratories. Method of administering amino acids to convalescing livestock and composition therefor. 3,699,219, Cl. 424-14.000.

Carlson, Carl B.; McKeeman, William M.; and Price, William C., to Burroughs Corporation. Address manipulation circuitry for a digital computer. 3,699,528, Cl. 340-172.500.

Carlson, Clarence A., to Northern Engraving Company. Method of electrodepositing coral copper on copper foil. 3,699,018, Cl. 204-52.00r.

Carlson, Ernest C.; Howells, Arthur J., Jr.; Jennings, Marvin D.; Eastman, Donald R.; and Sheets, Edward G., to International Harvester Company. Control system for material handling equipment. 3,698,580, Cl. 214-138.00r.

Carlsson, Stig Ake Ingomar: *See—*
Gagneun, Andre; Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingomar, 3,699,124.

Carothers Sheet Metal Company: *See—*
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Carpano & Pons S.A.: *See—*
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Carrier Corporation: *See—*
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Carroll, David I.: *See—*
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D., 3,699,333.

Carter, Clyde Thomas, to AMP Incorporated. Electrical connector having improved contact retention means. 3,699,502, Cl. 339-176.00m.

Carter-Wallace, Inc.: *See—*
Ludwig, Bernard J.; Berger, Frank M.; and Fukui, George M., 3,699,097.

Case, J. I., Company, mesne: *See—*
Lamer, Gerald P.; and Thiele, Duane L., 3,698,569.
Cash, Michael J.: *See—*
Eck, Bertil; and Cash, Michael J., 3,699,587.
Casper, Le Roy V. Balloon gun and game. 3,698,374, Cl. 124-11.000.
Cass, George R., to Canadian National Railway Company. Wheel slip detector. 3,699,563, Cl. 340-268.000.
Castro, Anthony J., to Akzona Incorporated. Polyhydroxamides and polyurethanes therefrom. 3,699,078, Cl. 260-47.0cb.
Caton, George, to Yorkshire Switchgear and Engineering Co., Limited. Electric circuit breakers. 3,699,290, Cl. 200-150.00l.
Cattanach, John, to Mobil Oil Corporation. Selective separation by a chromatographic process. 3,699,182, Cl. 260-674.0sa.
Cattaneo, Sergio, to Honeywell Information Systems Italia. Serial printer with fixed interposer. 3,698,529, Cl. 197-49.000.
Catug Corporation: *See—*
Stevens, John N., 3,698,349.
Caule, Elmer J.; Sperry, Philip R.; Pryor, Michael J.; and Ford, James A., to Olin Corporation. Oxidation resistant article of an iron base alloy containing chromium and aluminum and/or silicon. 3,698,964, Cl. 148-31.500.
Causer, Roy; Farren, John; Jones, Terence Leslie; Taylor, Brian Leslie; and Webster, Ronald Kerry, to United Kingdom Atomic Energy Authority. Scanning light detectors. 3,698,819, Cl. 356-203.000.
Cavalleri, Bruno; Bellasio, Elvio; Testa, Emilio; and Maffii, Giulio. Pharmacologically active compounds. 3,699,151, Cl. 260-473.00r.
Cebula, Thaddeus J.: *See—*
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Cebular, John V. Collapsible ladder device. 3,698,512, Cl. 182-164.000.
Cefilac: *See—*
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Celanese Corporation: *See—*
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Central Specialties Co.: *See—*
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Ceskoslovenska akademie ved: *See—*
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Chambolle, Stephane: *See—*
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Chandra, Grish; Owen, William J.; Lloyd, Norman C.; and Cooper, Bryan E., to Midland Silicones Limited. Organosilicon compounds. 3,699,140, Cl. 260-448.20n.
Chaney, Robert L., to Hewlett-Packard Company. Flow-through hollow cathode spectral light source and method of operating same. 3,699,383, Cl. 315-111.000.
Chang, David T. L. Packing guide for flexible materials. 3,698,655, Cl. 242-76.000.
Chapin, Richard D. Water distributing hose. 3,698,195, Cl. 61-12.000.
Charles, James A.: *See—*
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Chaston Medical & Surgical Products, Inc.: *See—*
Stone, Charles E., 3,698,393.
Chatourel, Pierre; and Lefebvre, Jean, to Regie Nationale des Usines Renault. Automatically operated multiple cavity die for low-pressure chill-casting. 3,698,471, Cl. 164-340.000.
Cheever, Daniel R.: *See—*
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Chemagro Corporation: *See—*
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Chemical Projects Limited: *See—*
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Chemiebau Dr. A. Zieren GmbH & Co. KG: *See—*
Brendt, Dieter; Helms, Gerd; and Keunecke, Gerhard, 3,699,008.
Cheney, Harold L., to Chevron Research Company. Orchard heater. 3,698,379, Cl. 126-59.500.
Chernow, Michael, to Monocraft, Inc. Clutch mechanism for jewelry pin. 3,698,044, Cl. 24-108.000.
Chesser, Billy G.: *See—*
Browning, William C.; and Chesser, Billy G., 3,699,042.
Chevron Reseah Company: *See—*
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Cheney, Harold L., 3,698,379.
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Smith, Calvin S.; and McLeod, William J., 3,699,218.
Sweeney, William A., 3,699,157.
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Chi Kai Kwok, Clyde, to Rippingille, Edward V., Jr. Fluid oscillator and pulsating dental syringe employing same. 3,698,416, Cl. 137-119.000.
Chibata, Ichiro; Kakimoto, Toshio; Shibatani, Takeji; and Nishimura, Noriyuki, to Tanabe Seiyaku Co., Ltd. Fermentative preparation of coenzyme A. 3,698,999, Cl. 195-29.000.
Chisholm, Eugene H.; and Stuart, Robert L. Detachable goose-neck towing device. 3,698,740, Cl. 280-491.00c.
Cho, Antonio. Lead sharpener. 3,698,456, Cl. 144-28.110.
Chrysler Corporation: *See—*
Hunter, William A., 3,698,160.
Chupp, John Paul, to Monsanto Company. 1-(3-Trifluoromethylphenyl)-4,6-diisopropyl-3, 5-dimethylhexahydro-1,3,5-triazin-2-one as a herbicide. 3,698,886, Cl. 71-93.000.
Chupp, John Paul, to Monsanto Company. Ureas and phytotoxicants. 3,698,887, Cl. 71-120.000.
Chvatlinsky, Kurt: *See—*
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Cisney, Merle E., to Crown Zellerbach Corporation. Hydroxymethyl, methylthio phenols. 3,699,172, Cl. 260-609.00f.
Cities Service Research & Development Company: *See—*
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Hatsuse, Toshikazu; Ueda, Hiromi; Ozawa, Shouiti; and Yasuda, Yuh, 3,699,412.
Clark, Edgar L., to Commercial Solvent Corporation. Water-soluble alkyd resin compositions. 3,699,065, Cl. 260-22.00r.
Clark Equipment Company: *See—*
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Grant, Lewis F., 3,698,737.
King, James F., 3,698,490.
Perez, Arthur, 3,698,205.
Clark, John B. Aberration-free compensator for use in white light interferometry. 3,698,814, Cl. 356-107.000.
Clark, Larry K.: *See—*
Hill, Frank W.; Bartlett, Peter G.; and Clark, Larry K., 3,699,512.
Clark, William H.; and Hays, William R., to Dow Corning Corporation. Silicone elastomer with unprimed adhesion. 3,699,072, Cl. 260-37.0sb.
Clary Corporation: *See—*
Reynolds, Robert W.; and Wight, George P., 3,698,823.
Clayton Manufacturing Company: *See—*
Cline, Edwin L., 3,698,243.
Cline, Edwin L., to Clayton Manufacturing Company. Apparatus for controlling the characteristics of fluid pressure operated friction type power absorption devices. 3,698,243, Cl. 73-135.000.
Clinkenbeard, Donald E., to Dayco Corporation. Endless power transmission belt testing means. 3,698,242, Cl. 73-94.000.
Clow Corporation: *See—*
Bevington, William J., 3,698,744.
Cochran, David L.; Deleray, Arthur L.; and Lehman, John P., to MB Associates. Telescopic rocket. 3,698,320, Cl. 102-49.300.
Coffey, Charles A., to Harris-Paint Company. Spray head. 3,698,645, Cl. 239-573.000.
Cohen, Edwin; and Altmilier, John C., to Singer Company, The. Apparatus to match the color of a monochrome display to average color of an adjacent full color display. 3,699,244, Cl. 178-5.40r.
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D., to Gno, Franklin, Corporation. Apparatus and methods for separating, concentrating, detecting, and measuring trace gases. 3,699,333, Cl. 250-41.9tf.
Cohen, Murray F.; and Tarasevich, Michael, to Kollsman Instrument Corporation. Apparatus using a beam of positive ions for controlled erosion of surfaces. 3,699,334, Cl. 250-49.5te.
Colantuono, William R., to Crucible Inc. Protective coating. 3,698,943, Cl. 117-53.000.
Colaud, Gerard; and Fanene, Bernard, to Societe Industrielle Honeywell Bull (Societe anonyme). Mounting system for printed circuit boards. 3,699,396, Cl. 317-101.0dh.
Cole, James B., to Boeing Company, The. Variable camber airfoil. 3,698,668, Cl. 244-44.
Cole, John Barrington: *See—*
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Cole, Roy D., to United States of America, Navy. Angular rate bombing system. 3,699,310, Cl. 235-61.50d.
Colgate-Palmolive Company: *See—*
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Grand, Paul S.; Falivene, Pasquale Joseph; and Furgal, Henry P., 3,698,095.

Collins, Edward C.; and Hittle, Eugene C., to Sears, Roebuck and Co. Under-cabinet radio. 3,698,780, Cl. 312-245.000.

Collins Radio Company: *See—*
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Compagnie Gervais Danone Hauts de Seine: *See—*
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Compagnie Industrielle des Telecommunications Cie: *See—*
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Compagnie Internationale fur l'Informatique: *See—*
Spain, Robert J., 3,699,550.

Compagnie Pechiney: *See—*
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Condon, Richard D., to Perkin-Elmer Corporation, The. Analysis of gaseous mixtures. 3,698,869, Cl. 23-232.00r.

Conner, John R. Self-cleaning filter system. 3,698,555, Cl. 210-138.

Connolly, John F.; Flannery, Robert J.; and Mc Collum, John D., to Standard Oil Company (Indiana). Electrochemical production of 1,4-dihydro aromatic compounds. 3,699,020, Cl. 204-73.000.

Connor, Daniel S.; and Krummel, Harry Karl, to Procter & Gamble Company, The. 1,3,5-Trihydroxy-2,4,6-benzene tricarboxylic acid and water soluble salts thereof. 3,699,159, Cl. 260-521.00r.

Conover, Lloyd H.: *See—*
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Consolidated Foods Corporation: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
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Cook, Einar. Weed burner. 3,698,380, Cl. 126-271.20a.

Cook, Robert G.: *See—*
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Cook Testing Co.: *See—*
Radig, Gary A.; Rowell, Cliva A., Jr.; and Edwards, Harvey R., 3,698,477.

Cooke, Brian Alfred; and Magee, James Arthur, to Imperial Chemical Industries Limited. Electrocoating process. 3,699,031, Cl. 204-181.000.

Cookson Sheet Metal Developments Limited: *See—*
Cookson, William, 3,698,590.

Cookson, William, to Cookson Sheet Metal Developments Limited. Frangible elements in sheet material. 3,698,590, Cl. 220-27.000.

Coon, David S.: *See—*
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Cooper, Bryan E.: *See—*
Chandra, Grish; Owen, William J.; Lloyd, Norman C.; and Cooper, Bryan E., 3,699,140.

Cooper, James Joseph, Jr.; and Schurter, Gary Lee, to International Telephone and Telegraph Corporation. Terminal connector. 3,699,497, Cl. 339-60.00r.

Cooperstein, Raymond. Method of detecting the presence of a defective lithium aluminate target in-reactor. 3,698,996, Cl. 176-19.0ld.

Copeland, John Alexander, III, to Bell Telephone Laboratories, Incorporated. Single wall domain lateral displacement. 3,699,548, Cl. 340-174.0tf.

Copland, George V.: *See—*
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Copystatics Manufacturing Corporation: *See—*
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Cordotex SA., mesne: *See—*
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Cornell, Richard Charles: *See—*
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Corning Glass Works: *See—*
Eckerlin, Herbert M., 3,698,632.

Cornwell Charles E., to Baily, Jennings, Jr., mesne. Method of producing tunnel or the like structure. 3,698,066, Cl. 29-458.000.

Corporate Foods Limited: *See—*
Kortschot, Cornelis; and Adams, Peter F., 3,698,914.

Corti, Costante: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,699,145.

Cosman, Cornelius M.; and Buker, Donald O., to American Metal Climax, Inc. Dephosphorization of ferrophosphorus. 3,699,213, Cl. 423-322.000.

Coste, Jean-Noel: *See—*
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Cotton, John W.: *See—*
Taylor, Glenn L.; Cotton, John W.; and Winkler, De Loss E., 3,699,184.

Couland, Roger, to Societe de Conditionnement en Aluminum. Apparatus for tapering flexible metal tubes. 3,698,221, Cl. 72-62.000.

Coulon, Edward I.; Miller, Benny Jay; and Mohr, Dale C., to Vogel Tool and Die Corporation. Apparatus for piercing openings in tubing. 3,698,274, Cl. 83-188.000.

Courtaulds Limited: *See—*
Sutton, John Anthony, 3,698,855.

Cowdrey, Roy M.; and Current, Wayne A., to Singer Company, The. Pedestal for electric scissors. 3,698,087, Cl. 30-228.000.

Cox, Robert M., to SLI Industries. Control valve assembly with mechanical feedback. 3,698,437, Cl. 137-625.620.

Coyle, James, to Shell Oil Company. Hydroxylation of aromatics. 3,699,175, Cl. 260-621.00g.

Crane, Paul J.; and Feese, Glenn A., to Magnavox Company, The. Facsimile systems transceivers and marking transducers therefor. 3,699,249, Cl. 178-6.60r.

Cranskens, Georg; Krober, Gunther; and Palm, Richard, to Lumoprint Zindler K.G. Photocopying machine having removable modules. 3,698,804, Cl. 355-3.000.

Crecelius, John D., to United States of America, Navy. Method for dispersing discrete particles. 3,698,185, Cl. 60-39.020.

Croix-Marie, Francis Marie Jean, to Bertin & Cie. Trimming a ground effect machine. 3,698,506, Cl. 180-118.000.

Cross Company, The: *See—*
Pierce, Guy Donald; and Runft, Rudi K., 3,698,056.

Crossman, Richard L., to Goodyear Tire and Rubber Company, The. Articulated disc brake configurations. 3,698,519, Cl. 188-73.200.

Crown Cork & Seal Company, Inc.: *See—*
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Crown Zellerbach Corporation: *See—*
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Crucible Inc.: *See—*
Colantuono, William R., 3,698,943.
Kasak, August; Thompson, Vernon R.; and Moll, John H., 3,698,962.

Crucible, Inc., mesne: *See—*
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CTP Industries Inc.: *See—*
Kamins, Seymour; Rosenberg, Norman; and Bentsen, Per, 3,698,289.

Culp, Duane. Pressure discharge waste disposal apparatus. 3,698,019, Cl. 4-10.000.

Cummings, John P.; and Gomoll, Timothy J., to Owens-Illinois, Inc. Inert gas shield for atomic absorption or flame emission spectrometer. 3,698,643, Cl. 239-299.000.

Cunha, Harold; and Kostrzewski, James A., to Itek Corporation. Container replacement system. 3,698,454, Cl. 141-375.000.

Cunningham, Arthur L., to Sherwin-Williams Company, The. Coating composition containing urethan-modified epoxidized ester and polycarboxylic acid material. 3,699,061, Cl. 260-18.0pt.

Cunningham, Arthur L., to Sherwin-Williams Company, The. Carboxylic curing agent. 3,699,064, Cl. 260-22.0ep.

Curran, Robert E.; Robertson, Glenn D., Jr.; and Ketchpel, Richard D., to Hughes Aircraft Company. Multielement conductive faceplate. 3,698,884, Cl. 65-43.000.

Current, Wayne A.: *See—*
Cowdrey, Roy M.; and Current, Wayne A., 3,698,087.

Currie, William E., to Honeywell Inc. P.P.I. display utilizing magnetic recording apparatus. 3,699,587, Cl. 346-74.00m.

Curry, Renwick E.: *See—*
National Aeronautics and Space Administrator, 3,699,511.

Curtiss-Wright Corporation: *See—*
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Cutler, Hymie, to Bendix Corporation, The. Numerical control system for interrupted cutting conditions. 3,698,268, Cl. 82-2.00b.

Cuzzone, Raymond: *See—*
Vrabeli, Edward A.; and Cuzzone, Raymond, 3,699,491.

Cvacho, Daniel S.; Fastabend, Patrick A.; Garriques, Alfred L.; and Jensen, Eric L., to Reynolds Metals Company. Container construction and closure plug therefor. 3,698,593, Cl. 220-60.00a.

Cybart, Eugene M. Electro-magnetic railway track. 3,699,329, Cl. 246-182.000.

Czerski, Jan, to Shell Oil Company. Injection molding assembly. 3,698,849, Cl. 425-247.000.

Dahlem, Billy J.; and Martin, John A., to Power-Curve Conveyor Company. Bag compactor for conveying apparatus. 3,698,572, Cl. 214-6.0dk.

Dahlgren, Lennart Gunnar Oskar, to Hasselblad, Fritz Victor. Bearings for precision apparatus. 3,698,773, Cl. 308-8.000.

Dahlquist, Ernst A.; Polakoqski, Stanley J.; and Vaalburg, Teunis, to Rapistan Incorporated. Valve unit for vacuum operated palletizer lifting heads. 3,698,423, Cl. 137-454.200.

Dahlstrom, Donald A.: *See—*
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Daihatsu Kogyo Co., Ltd.: *See—*
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D'Amato, Gerald J.: *See—*
Thompson, James E.; and D'Amato, Gerald J., 3,699,568.

Dana Corporation: *See—*
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Dann, Bert H., to Bell & Howell Company. Signal correcting apparatus for cancelling differental phase ennons in color video tape recordings. 3,699,243, Cl. 178-5.400.

Danti, Bernard R.; and Brefka, Paul E., to Millipore Corporation. Apparatus for converting rotational displacement into linear displacement. 3,699,291, Cl. 200-153.001.

Daran Products, Inc.: *See—*
De Angelis, William M., 3,698,683.

Darcas, Claude; Jobert, Raymond; and Laviron, Charles, to UGILOR. Process for the synthesis of hydroxy-2 methylthio-4 butyronitrile. 3,699,148, Cl. 260-465.600.

Dart Industries, Inc.: *See—*
Ashton, Harold P.; and Swett, James B., 3,698,460.
Schrage, Albert; and Readio, Philip D., 3,699,186.
Swett, James B.; and Smith, Sidney Z., 3,698,783.

Daugherty, T. Stevens: *See—*
Joyce, John Frederick; and Daugherty, T. Stevens, 3,699,196.

Davis, Charles, to Davis Construction Corporation. Cover plate attachment for elevating scraper. 3,698,109, Cl. 37-124.000.

Davis Construction Corporation: *See—*
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Davis, Malcolm F.: *See—*
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Davis, Robert E.: *See—*
Amici, Francis Robert; Davis, Robert E.; and Levine, Richard, 3,698,134.

Davis, Samuel B., Jr., to Vits Maschinenbau GmbH. Fastening tools. 3,698,231, Cl. 72-391.000.

Davis, Sheridan: *See—*
Stein, Bernard; and Davis, Sheridan, 3,699,343.

Davis, William B.: *See—*
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Dayco Corporation: *See—*
Clinkenbeard, Donald E., 3,698,242.
Jacob, Richard J., 3,698,443.

Daymond, Stewart F. Conduits. 3,698,193, Cl. 61-1.00r.

De Angelis, William M., to Daran Products, Inc. Valve for laboratory glassware. 3,698,683, Cl. 251-209.

De Fabritis, Raymond P.; Fefferman, Gerald Burt; Gesner, Bruce David; and Radner, Raymond John, to Bell Telephone Laboratories, Incorporated. Magnetic bubble device and method of manufacture. 3,699,552, Cl. 340-174.0tf.

De Graff, Peter H., to National Cash Register Company, The. Compact print head assembly with antirebounding means. 3,698,528, Cl. 197-1.000.

De Jong, Eduard B. M., to Technicon Instruments Corporation. Apparatus for pumping with viscosity control. 3,698,870, Cl. 23-253.00r.

De Koe, Oscar Bernardus Philomenus Rikkert; and Verbeek, Robert Jacques, to U.S. Philips Corporation. Telecommunication system with time division multiplex. 3,699,260, Cl. 179-15.0bs.

De Lucia, Victor E., to Torr Laboratories, Inc. High voltage miniaturized relay. 3,699,486, Cl. 335-131.000.

De Nobel, Dirk; and De Waal, Jan A. G., to U.S. Philips Corporation. Method of applying contacts to a semiconductor body. 3,698,941, Cl. 117-212.000.

De Sa E Silva, Claudio; and Cheever, Daniel R., to Summit Engineering Corporation. Power drive circuit for inductive loads. 3,699,413, Cl. 318-138.000.

De Savage, Bernard F.: *See—*
Belson, Henry S.; De Savage, Bernard F.; and Tebble, Robert S., 3,699,553.

De Waal, Jan A. G.: *See—*
De Nobel, Dirk; and De Waal, Jan A. G., 3,698,941.

Dean, George A., to Dean Research Corporation. Transporting system. 3,698,577, Cl. 214-38.0ba.

Dean Research Corporation: *See—*
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Dean, Sheldon W., to Olin Corporation. Articles having a low friction surface and process of making same. 3,698,932, Cl. 29-195.00r.

Debreczeni, Eugene J.; and Kushlefsky, Bernard G., to M & T Chemicals, Inc. Preparation of diatannones. 3,699,138, Cl. 260-429.700.

Decca Limited: *See—*
Hendley, Dennis Alfred; and Boersma, Sipko L., 3,699,558.

Deere & Company: *See—*
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Deiichi Seiyaku Company, Limited: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.

Del Mar Engineering Laboratories: *See—*
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Deleray, Arthur L.: *See—*
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Delius, Hermann: *See—*
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Delli-Gatti, John L., to Fair-Quip Corporation. Auger mining machine. 3,698,768, Cl. 299-55.000.

Delmas, Jean R., to Agence Nationale de Valorisation de la Recherch Centre Nationale D'Etudes des Telecommunications. Optical masking device. 3,698,808, Cl. 355-45.000.

Deltrol Corporation: *See—*
Harris, John L., 3,699,281.

Demers, Alfred John: *See—*
Leeks, Robert Ernest; and Demers, Alfred John, 3,698,933.

Deming, Roy, to Kent-Moore Corporation. Belt tension gauge. 3,698,244, Cl. 73-144.000.

Denis, Claude P-E: *See—*
Panter, Peter D.; Denis, Claude P-E; and Kaempf, Gerhard P., 3,698,028.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Konishi, Kozo; Suzui, Masaaki; Otake, Michio; and Maeda, Tatuo, 3,699,112.

Denney, Jon R. Fastener actuator. 3,698,267, Cl. 80-185.000.

DePietro, Anthony J.: *See—*
Smith, Bernard; and DePietro, Anthony J., 3,698,585.

Derr, Vernon F.: *See—*
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Descant, Mark. Paint applicator. 3,698,031, Cl. 15-210.000.

Desma-Werke G.m.b.H.: *See—*
Zeug, Robert; and Koch, Friedrich, 3,698,694.

Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntzi Gesellschaft mit beschrankter Haftung & Co.: *See—*
Schultz, Rudolf, 3,698,118.

Deutsche Edelstahl-Werke Aktiengesellschaft: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Schreyer, Gerd; Weiberg, Ottl; and Weigert, Wolfgang, 3,699,217.

Deutsche Spinnereimaschinenbau Insolstadt Niederlasng der Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
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Deutsche Texaco Aktiengesellschaft: *See—*
Pascoe, Peter; Josten, Friedrich; Haferkamp, Wilhelm; and Lucker, Willi, 3,698,861.

Diamond International Corporation: *See—*
Bixler, Kenneth D., 3,698,623.

Diamond, Norman: *See—*
Dick, George W.; and Diamond, Norman, 3,698,630.

Diamond, Robert F.; and Kingston, George W., to Timber Engineering Company. Wall mounted shelf assembly. 3,698,329, Cl. 108-42.000.

Dick, George W.; and Diamond, Norman, to Metropolitan Life Insurance Co. Insurance calculator. 3,698,630, Cl. 235-78.000.

Dickie, Ray A.; and Labana, Santokh S., to Ford Motor Company. Rubber-modified acrylic copolymer thermoset. 3,699,185, Cl. 260-836.000.

Diebold, Adolf; and Matthias, Marx, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Metallizing expanded plastics articles. 3,698,929, Cl. 117-71.000.

Diebold, Incorporated: *See—*
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Dietrich, Henri, to Ciba-Geigy Corporation. N-arylsulfonyl urea derivatives of nitrogen containing heterocyclics as hypoglycemic agents. 3,699,226, Cl. 424-244.000.

Dietrich, Hermann: *See—*
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DiFazio, Joseph, to Acorn Products Company. Sliding panel lock. 3,698,883, Cl. 49-449.000.

Dimeler, Glenn R.: *See—*
Mills, Ivor W.; Dimeler, Glenn R.; Kirk, Merritt C., Jr.; and Boyer, Jackson S., 3,699,071.

Dimitri, Mitchell S.; and Nissan, Alfred H., to Westvaco Corporation. Production of large surface area lignins. 3,699,091, Cl. 260-124.00r.

Dimitri, Mitchell S., to Westvaco Corporation. Process for producing large surface area lignins. 3,699,093, Cl. 260-124.00r.

Dirian, Gregoire, to Commissariat a l'Energie Atomique. Method of continuous separation by gas-phase chromatography on fixed granular reds. 3,698,156, Cl. 55-67.000.

Disco Industries, Inc.: *See—*
Boyles, Elmo N., 3,698,518.

Distefano, John F., to Borg-Warner Corporation. Pressure equalizer for unloading a compressor during start-up. 3,698,839, Cl. 417-299.000.

Dixon, William D., to Monsanto Company. Certain 1-aryl or aralkyl-3-(pyridyl) formimidoyl-ureas or thioureas. 3,699,110, Cl. 260-294.80e.

Dobler, Christian D.; and Lilly, Herbert J., Jr., to Subsea Equipment Associates Limited, mesne. Fluid-swivel. 3,698,433, Cl. 137-615.000.

Dobrowolski, Zbigniew C., to General Signal Corporations. Vacuum pump lubrication system. 3,698,515, Cl. 184-6.230.

Dodd, John A., Jr.; and Geshner, Robert A., to RCA Corporation. Method of making a graded photoprinting master. 3,698,903, Cl. 96-36.100.

Dodds, Irvine. Keyboard for a typewriter. 3,698,532, Cl. 197-100.000.

Dodgen, John N. Jack and tie-down system for a vehicle mounted camper. 3,698,758, Cl. 296-23.00m.

Doebley, Eugene J.: *See—*
MacDonald, Hugh D.; and Doebley, Eugene J., 3,698,183.

Dohan, William L., to Ballymore Company. Modular fixed-level work platform. 3,698,511, Cl. 182-113.000.

Doki, Yoshikuni, to Honeywell Inc. Automatic-manual change-over switch capable of providing pressure indication. 3,698,247, Cl. 73-388.brn.

Domerico, Penelope B., to Dow Chemical Company, The. Substituted polyhalo-4-nitropyridines. 3,699,108, Cl. 260-290.0hl.

Donaldson, Darrell J.; Normand, Floyd L.; and Drake, George L., Jr., to United States of America, Agriculture. Process for producing flame resistant organic textiles. 3,698,854, Cl. 8-116.00p.

Donham, James E., to Amoco Production Company. Reaction products of substituted imidazolines and amino tri (lower alkylidenephosphonic acids). 3,699,118, Cl. 260-309.600.

Dorr, Robert Charles, to Bell Telephone Laboratories Incorporated. Self-checking combinational logic counter circuit. 3,699,322, Cl. 235-153.000.

Dosch, Robert G.; and O'Neill, William M., to United States of America, United States Atomic Energy Commission. Preparation of ferroelectric ceramic compositions. 3,699,044, Cl. 252-62.900.

Dow Chemical Company, The: *See—*
Domerico, Penelope B., 3,699,108.
Eichhorn, Jacob; and Roth, Stanley F., 3,698,934.

Dow Corning Corporation: *See—*
Clark, William H.; and Hays, William R., 3,699,072.
Skobel, Max, 3,698,988.

Dow Corning Limited: *See—*
Griffin, Philip Alfred, 3,698,982.

Downey, Raymond E., to Goodyear Tire and Rubber Company, The. Polyester-vinyl chloride copolymer adhesive. 3,699,189, Cl. 260-873.000.

Doyle, Brian W.: *See—*
Sweet, Ervin J.; Doyle, Brian W.; and Rygelis, Joseph, 3,698,743.

Doyle, Peter; and Stacey, Joseph Gilbert, to Imperial Chemical Industries Limited. Pharmaceutical compositions of phenyl, pyridyl, alkanic acid and derivatives there. 3,699,227, Cl. 424-263.000.

Drackett Company, The: *See—*
Mack, Frank Joseph; and Simpkins, Terry John, 3,698,021.

Drake, Colin Anthony. Trailers. 3,698,734, Cl. 280-34.00r.

Drake, George L., Jr.: *See—*
Donaldson, Darrell J.; Normand, Floyd L.; and Drake, George L., Jr., 3,698,854.

Drechsler, Rudolph Charles, to Bell Telephone Laboratories, Incorporated. Apparatus for generating a logarithmically related series of digitally coded signal quantities. 3,698,631, Cl. 235-152.000.

Dresser Industries, Inc.: *See—*
Nell, David J.; and Lewis, Thomas W., II, 3,698,942.
Werlein, Eugene R.; Hollingsworth, John W.; and Pinson, Lyndon D., 3,699,231.

Drew Chemical Corporation: *See—*
Petrey, Ernest O., Jr., 3,699,047.
Petrey, Ernest Quentin, Jr.; and Werner, Ronald M., 3,699,052.

Drinkard, B. M.: *See—*
Allen, Paul T.; and Drinkard, B. M., 3,698,157.

Driskell, Carl R., to United States of America, Navy. Submerged periscope simulator. 3,698,102, Cl. 35-25.000.

Drukker, Alexander E., to Colgate-Palmolive Company. 11-Aminoalkylidenemorphanthridines. 3,699,099, Cl. 260-239.00d.

Du Bois, Robert Clark; Mikan, Donald G.; and Miller, Wayne H., to Pitney-Bowes, Inc. Compensated toner density control for electrostatic photocopies. 3,698,356, Cl. 118-637.000.

Du Pont de Nemours, E. I., and Company: *See—*
Evans, William L., 3,698,316.
Hoell, Paul C., 3,699,267.
Johnson, Thomas, 3,699,085.

Duell, Richard J.: *See—*
Cann, Peter L.; and Duell, Richard J., 3,698,833.

Duerden, Francis, to Marconi Company Limited, The. Data store equipments. 3,699,527, Cl. 340-172.500.

Dunbar, Robert A., to Remvac System Corporation. Coded card and reader therefor. 3,699,311, Cl. 235-61.11h.

Dunn, Joseph B., to General Motors Corporation. Cabinet door mounting. 3,698,781, Cl. 312-327.000.

Dunn, Wendell E., Inc.: *See—*
Dunn, Wendell E., Jr., 3,699,206.

Dunn, Wendell E., Jr., to Dunn, Wendell E., Inc. Process for beneficiation of titaniferous ores. 3,699,206, Cl. 423-74.000.

DuVall, Wilbur E., to Xerox Corporation, mesne. Apparatus for rapid action displacement control. 3,699,555, Cl. 340-174.10c.

Dyche, James W., to Sylvania Electric Products, Inc. Handwriting authentication technique. 3,699,517, Cl. 340-146.30q.

Dyer, Lawrence Dean, to Texas Instruments, Incorporated. Method of obtaining phased growth of epitaxial layers. 3,698,944, Cl. 117-201.000.

Dykast, Jaroslav, to Vyzkumny Ustav Bavinarsky. Spinning machine. 3,698,175, Cl. 57-58.890.

Dynamit Nobel Aktiengesellschaft: *See—*
Becker, Franz, 3,698,315.
Gardziella, Arno, 3,699,187.
Termin, Erich; and Bleh, Otto, 3,699,137.

Early, Roger: *See—*
Midulla, Guiseppe, 3,699,046.

Eastcott, Peter de Hertel; and Welch, James Ernest, to Canadian General Electric Company Limited. Means for attaching a hub to a shaft. 3,698,750, Cl. 287-52.00r.

Eastman, Donald R.: *See—*
Carlson, Ernest C.; Howells, Arthur J., Jr.; Jennings, Marvin D.; Eastman, Donald R.; and Sheets, Edward G., 3,698,580.

Eastman Kodak Company: *See—*
Abbott, Thomas L., 3,698,896.
Albers, Kenneth H.; and Snapp, Thomas C., Jr., 3,699,165.
Baptista, John L.; Rauner, Frederick J.; and Ford, John A., Jr., 3,699,135.
Elins, Herbert S.; and Van Meter, James P., 3,698,901.
Frank, Lee F., 3,698,100.
Gnage, Oliver W., 3,698,602.
Gompf, Thomas E.; and Lum, Kin Kwong, 3,698,897.
Harter, James E.; and Rodriguez, Juan A., 3,698,809.
Harvey, Donald M., 3,699,586.
Hickey, Lionel R.; and Guyette, Frank L., 3,698,805.
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,699,025.
Lestina, Gregory James; and Stern, Max Herman, 3,698,909.
Rosenburgh, Norman John, 3,698,654.
Thomsen, William F.; and Von Bramer, Paul T., 3,699,076.
Weaver, Max A.; and Wallace, David J., 3,699,092.
Wininger, John M., Jr., 3,698,096.

Ebco Manufacturing Company: *See—*
Radcliffe, Richard J., 3,698,603.

Ebeling, Robert W., Jr., to United Aircraft Corporation. Nonsustaining hybrid propellant grain. 3,698,191, Cl. 60-220.000.

Eberle, Marcel K.; and Houlihan, William J., to Sandoz-Wander, Inc. Process for 5 H-imidazo [2,1-a] isoindoles. 3,699,119, Cl. 260-309.600.

Eberspacher, J.: *See—*
Kofink, Siegfried, 3,699,354.

Eck, Bertil; and Cash, Michael J., to Honeywell Inc. Recorder for recording on heat-sensitive material. 3,699,587, Cl. 346-139.00c.

Eck, Richard H. Directional infrared heating element. 3,699,309, Cl. 219-553.000.

Eckerlin, Herbert M., to Corning Glass Works. Fluidic adder-subtracter utilizing threshold logic. 3,698,632, Cl. 235-201.0pf.

Eckhardt, Wilfried O., to Hughes Aircraft Company. Offswitching of liquid metal arc switching device by internal current diversion to an auxiliary electrode. 3,699,384, Cl. 315-111.000.

Economics Laboratory, Inc.: *See—*
Nystuen, David L., 3,698,644.

Eder, Otto: *See—*
Schwab, Johann; Buchel, Kurt; Eder, Otto; Hascic, Wladimir; and Marek, Ludwig, 3,698,027.

Edwards, Harrison F. Ionic wind machine. 3,699,387, Cl. 317-4.000.

Edwards, Harvey R.: *See—*
Radig, Gary A.; Rowell, Cliva A., Jr.; and Edwards, Harvey R., 3,698,477.

Edwards, William F. Roll gate latch. 3,698,752, Cl. 292-104.000.

Egami, Katsusuke: *See—*
Iwaoka, Mutsuo; Takegawa, Akio; Inoue, Hiraku; Egami, Katsusuke; Nishikura, Kouiti; Yamashita, Shigeji; and Nagayasu, Tadahiro, 3,698,178.

Egger, Georg M. Method of producing rubber profiles. 3,699,197, Cl. 264-40.000.

Ehrlich, Melvin P.; Stoller, Milton; and Grand, Stanley, to Hycel, Inc. Biological cell analyzing system. 3,699,336, Cl. 250-83.3uv.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Roll changers. 3,698,226, Cl. 72-239.000.

Eichhorn, Jacob; and Roth, Stanley F., to Dow Chemical Company, The. Method for making high barrier coated papers. 3,698,934, Cl. 117-76.00p.

Eilts, Larry E., to United States of America, Interior. Reactor fault relay. 3,699,391, Cl. 317-18.00d.

Eirich, Gustav: *See—*
Eirich, Wilhelm; and Eirich, Gustav, 3,698,842.

Eirich, Wilhelm; and Eirich, Gustav. Pelletising apparatus. 3,698,842, Cl. 425-75.000.

Eisenberg, Morris, to Elca Battery Company. Galvanic cell. 3,698,953, Cl. 136-20.000.

Eisner, Steve, to Norton Company. Vibratory process. 3,699,014, Cl. 204-35.00r.

Eisner, Steve, to Norton Company. Polar activating particles for electrodeposition process. 3,699,017, Cl. 204-49.000.

Ekstrand, James, to Burroughs Corporation. Method and apparatus for inspecting plated-through printed circuit board holders. 3,698,821, Cl. 356-237.000.

Elazar, Shmuel, to Statham Instrument, Inc. Differential amplifier. 3,699,469, Cl. 330-30.00d.

Elca Battery Company: *See—*
Eisenberg, Morris, 3,698,953.

Electric Reduction Company of Canada, Ltd.: *See—*
Rapson, William H., 3,698,995.

Electrostatic Equipment Corporation: *See—*
Goodridge, Walter R., 3,698,847.

Elektro-Physik Hans Nix & Dr. Ing. Steinguever, KG: *See—*
Steingroever, Erich, 3,699,487.

Elins, Herbert S.; and Van Meter, James P., to Eastman Kodak Company. Photographic elements, compositions and processes. 3,698,901, Cl. 96-33.000.

Ellis, Gaylord O.; and Halat, John A., to Sperry Rand Corporation. Power transmission. 3,698,286, Cl. 91-486.000.

Ellis, Walter S., to Schulze & Burgess Company. Variable positioning means. 3,698,052, Cl. 29-38.00c.

Emanuel, Marom: *See—*
Mueller, Rolf K.; and Emanuel, Marom, 3,698,787.

Emerson & Cuming, Inc., mesne: *See—*
Henderson, Craig, 3,699,050.

Emmett, Robert C., Jr.; Dahlstrom, Donald A.; and Brozovich, John C., to Envirotech Corporation. Apparatus for steam drying filter cake. 3,698,556, Cl. 210-178.000.

Emoto, Masayuki; and Maki, Yoshiyuki, to Hitachi Limited. Alkaline-electrolyte-zinc anode air-depolarized battery. 3,698,956, Cl. 136-86.00a.

Ence, Elmars, to Olin Corporation. High conductivity, high strength copper alloys. 3,698,965, Cl. 148-32.500.

Endou, Hidehiro; and Yokota, Takashi, to Yokota Kinzoku Kogyo Co., Ltd. Curtain hanger. 3,698,034, Cl. 16-87.40r.

Energy Conversion Devices, Inc.: *See—*
Neale, Ronald G., 3,699,543.

Engel, Heinz: *See—*
Mohr, Bernhard; Engel, Heinz; and Heijnis, James Watt Ijsbrand, 3,698,614.

Engelbach, Heinz: *See—*
Armbrust, Herbert; Sturm, Hans Juergen; Engelbach, Heinz; Wistuba, Hermann; Stoessel, Armin; and Krabetz, Richard, 3,699,134.

Engelhard Minerals & Chemicals Corporation: *See—*
Rubin, Leonard R., 3,698,050.

English Electric Company, The: *See—*
Paddison, Eric; Wilson, Christopher George; and Gray, Frederick Martin, 3,699,431.

Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., to Minnesota Mining and Manufacturing Company. Conductive probe assembly and method of using. 3,699,501, Cl. 339-108.0tp.

Enroe, Paul V.: *See—*
Jones, John E.; and Enroe, Paul V., 3,699,312.

Enshu Limited: *See—*
Sakamoto, Toemon, 3,698,442.

Enterprise Brass Works: *See—*
Nelson, Lowell F., 3,698,592.

Entwistle, Clive E. Shoulder saddle assembly. 3,698,608, Cl. 224-6.000.

Enviro Control, Inc.: *See—*
Bochinski, Julius H., 3,699,559.

Environment Metrology Corporation: *See—*
Brown, Verne R., 3,699,432.

Envirotech Corporation: *See—*
Emmett, Robert C., Jr.; Dahlstrom, Donald A.; and Brozovich, John C., 3,698,556.

EPC & G, Inc., mesne: *See—*
Hodge, Thomas, Jr.; and Bradie, Peter R. (said Hodge, Thomas, Jr. assor. to), 3,699,564.

Erhardt, William A., Jr., to TRW Inc. Gaging mechanism for fastener attaching machine. 3,698,616, Cl. 227-3.000.

Erickson, Roy O.: *See—*
Eshelman, Philip V.; Erickson, Roy O.; and Marsh, Keith D., 3,698,372.

Eshelman, Philip V.; Erickson, Roy O.; and Marsh, Keith D., to Holley Carburetor Company. Throttle return spring redundancy system. 3,698,372, Cl. 123-198.0b0.

Espanion, Gunther: *See—*
Feltgen, Karl-Heinz; and Espanion, Gunther, 3,698,610.

Espunes, Luis Arizmendi, to Instituto de Quimica Fisica Rocasolano. Process for the lubrication of mechanical systems subjected to very high contact pressure. 3,698,513, Cl. 184-5.000.

Esso Production Research company: *See—*
Matthews, Jamie F., Jr., 3,698,199.

Esso Research and Engineering Company: *See—*
McQuade, John E., Jr., 3,698,978.

Eubank, William J., to Irvin Industries Inc. Spring latching safety belt push type. 3,698,046, Cl. 24-230.00a.

European Atomic Energy Community (Euratom): *See—*
Grin, Michel; and Marchal, Francois, 3,699,297.

Evans, David F.: *See—*
Litvinoff, James R.; and Evans, David F., 3,698,327.

Evans, Wendell I., to Cincinnati Milacron, Inc. Multisection valve and housing therefor. 3,698,435, Cl. 137-625.180.

Evans, William L., to Du Pont de Nemours, E. I., and Company. Detonating fuse of petn-polyethylacrylate. 3,698,316, Cl. 102-27.000.

Everett, Cecil D., to Warner & Swasey Company, The, mesne. Automatic balancing device. 3,698,139, Cl. 51-237.000.

Everett, James L., III. Dynamically matched set of golf clubs. 3,698,239, Cl. 73-65.000.

Ewing, Channing L., to United States of America, Navy. Vertebral fracture prevention system. 3,698,670, Cl. 244-122.0ag.

Expandet S.A.: *See—*
Mallet, Emile, 3,698,279.

Factory Mutual Research Corporation: *See—*
Livingston, William L., 3,698,481.
Livingston, William L., 3,698,482.

Fagan, James R., to North American Rockwell Corporation. Film viewer. 3,699,327, Cl. 240-41.300.

Fagan, William F.: *See—*
Kobler, Richard; and Fagan, William F., 3,698,723.

Fair-Quip Corporation: *See—*
Delli-Gatti, John L., 3,698,768.

Fairbanks, Henry N., to Itek Corporation. Photographic processor. 3,698,306, Cl. 95-94.000.

Fairchild Camera and Instrument Corporation: *See—*
Blome, Eugene R., 3,698,928.

Fairchild Industries, Inc.: *See—*
Hoyer, Sigurd, 3,699,576.

Falivene, Pasquale Joseph: *See—*
Grand, Paul S.; Falivene, Pasquale Joseph; and Furgal, Henry P., 3,698,095.

Fallon, Merton R.: *See—*
Smith, Vern; Fallon, Merton R.; and Johnston, Mack S., 3,698,417.

Fanene, Bernard: *See—*
Colaud, Gerard; and Fanene, Bernard, 3,699,396.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Feltgen, Karl-Heinz; and Espanion, Gunther, 3,698,610.
Hagemann, Hermann, 3,699,162.
Hermann, Karl-Heinz; Schneider, Joachim; Rudolph, Hans; and Nawrath, Gunter, 3,699,183.
Peters, Karl-Heinz; and Neeff, Rutger, 3,699,126.
Roever, Wilhelm; Junghanss, Helmut; and Kauczor, Hans-Werner, 3,699,207.
Straub, Richard K., 3,698,701.

Farren, John: *See—*
Causer, Roy; Farren, John; Jones, Terence Leslie; Taylor, Brian Leslie; and Webster, Ronald Kerry, 3,698,819.

Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griefiths, Graham Ernest, to Balston, W. & R., (Industrial) Limited. Porous support core for disposable tube filter. 3,698,562, Cl. 210-488.000.

Fassler, Michael H.; and Perron, James S., to United Aircraft Corporation. Method of removing silaceous cores from nickel and cobalt super alloy castings. 3,698,467, Cl. 164-132.000.

Fastabend, Patrick A.: *See—*
Cvacho, Daniel S.; Fastabend, Patrick A.; Garriques, Alfred L.; and Jensen, Eric L., 3,698,593.

Federal Paper Board Company, Inc.: *See—*
Arneson, Edwin L., 3,698,151.

Federico, Armando; and Guarino, Henry R., to Avco Corporation. Monitoring system for physiological support systems. 3,698,381, Cl. 128-1.00r.

Feese, Glenn A.: *See—*
Crane, Paul J.; and Feese, Glenn A., 3,699,249.

Fefferman, Gerald Burt: *See—*
De Fabritis, Raymond P.; Fefferman, Gerald Burt; Gesner, Bruce David; and Radner, Raymond John, 3,699,552.

Feier, Milton: *See—*
Pantzer, Myron; and Feier, Milton, 3,698,852.

Fein, Marvin; Loprest, Frank; and Shaheen, Donald G., to Thiokol Chemical Corporation. Solid stablized hydrazinium diperchlorate propellant. 3,698,969, Cl. 149-19.000.

Feiss, Rene T., to Sulzer Brothers Limited. Method for mounting a pipe in a perforated plate. 3,698,067, Cl. 29-470.100.

Fekete, Frank; Thrash, David J.; and Pulman, Leonard J., to Koppers Company, Inc. Polyester laminate and method for manufacture. 3,698,981, Cl. 156-293.000.

Feltgen, Karl-Heinz; and Espanion, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Process and device for the manufacture of a non-woven matted web from synthetic yarn. 3,698,610, Cl. 226-7.000.

Fenwick, Jay G., to Streater Industries, Inc. Display stand. 3,698,567, Cl. 211-183.000.

Fernstrom, Gustaf Harry, to Atlas Copco Aktiebolag. Feed to driving tool having band held screws. 3,698,599, Cl. 221-25.000.

Ferris, Frank Donald. Dispensing for medicaments. 3,698,390, Cl. 128-222.000.

Feuersanger, Alfred E.; and Wassermann, Moe S., to GTE Labatories Incorporated. Solid state device having dielectric and semiconductor films sandwiched between electrodes. 3,699,409, Cl. 317-238.000.

Finch, Thomas Ellwood, to General Electric Company. Temperature controlled soldering iron. 3,699,306, Cl. 219-241.000.

Finch, William L. Flare gun. 3,698,317, Cl. 102-37.400.

Fine, Leonard Wolfe; Matsuda, Ken; and Photis, James Mitchell, to American Cyanamid Company. Catalytic hydration of nitriles. 3,699,164, Cl. 260-561.00n.

Fink, Irving E. Pressure casting devices for casting hollow products. 3,698,470, Cl. 164-281.000.

Fiorentino, Antonio F. Remote radio winch control unit. 3,699,578, Cl. 343-225.000.

Firth, William Charles, Jr.; and Frank, Simon, to American Cyanamid Company. Certain nitrogen-fluorine compounds and methods of preparation. 3,699,094, Cl. 260-221.000.

Fischer, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Domain propagation arrangement. 3,699,551, Cl. 340-174.0tf.

Fisher, Ivan E., to Owatonna Manufacturing Company. Reel construction with hexagonal spiders for mounting both bats and tine bars. 3,698,166, Cl. 56-220.000.

Fisher, John A., to U.S. Divers Company. Adjustable breathing gas pressure regulator. 3,698,425, Cl. 137-505.250.
Fitting, Samuel E.; and Green, Gary W., to United Aircraft Corporation. Inlet noise silencer for a jet engine. 3,698,509, Cl. 181-33.0ha.
Flannery, Robert J.: *See—*
Connolly, John F.; Flannery, Robert J.; and Mc Collum, John D., 3,699,020.
Fleissner, Heinz, to Vepa AG. Apparatus for the continuous gaseous treatment of textile materials. 3,698,049, Cl. 26-60.000.
Fleurquin, Yves; and Bruckmann, Andre, to La Cellophane. Process for the preparation of iridescent films and filaments and the product so produced. 3,698,930, Cl. 117-45.000.
Flex Key Corporation: *See—*
Sudduth, William B., 3,699,294.
Flint, Bruce K., to Acton Research Corporation. Diffraction grating with two diffracting surfaces. 3,698,795, Cl. 350-162.00r.
Flint, John Anthony; and Blake, Graham John, to Imperial Chemical Industries Limited. Emulsion polymerisation of vinyl chloride. 3,699,068, Cl. 260-29.600.
Flittie, William J. Feedstuff handling and apparatus. 3,698,578, Cl. 214-58.000.
Fluhr, Frederick R.: *See—*
Brown, Ray B.; Fluhr, Frederick R.; and Hall, George L., 3,698,797.
Fluidic Controls Corporation: *See—*
Kutz, Aaron, 3,698,432.
Flynn, John F. Automatically aerated leaching field system. 3,698,194, Cl. 61-11.000.
Fogarty, Robert L.: *See—*
Baker, Ronald E.; Fogarty, Robert L.; and Slagel, Edwin C., 3,698,587.
Follette, Neil: *See—*
Bowles, Arnold G.; and Follette, Neil, 3,698,843.
Foote, Richard W. Label dispenser. 3,698,600, Cl. 221-70.000.
Foray Industries, Inc.: *See—*
Iwaoka, Mutsuo; Takegawa, Akio; Inoue, Hiraku; Egami, Katsusuke; Nishikura, Kouiti; Yamashita, Shigeji; and Nagayasu, Tadahiro, 3,698,178.
Ford, James A.: *See—*
Caule, Elmer J.; Sperry, Philip R.; Pryor, Michael J.; and Ford, James A., 3,698,964.
Ford, John A., Jr.: *See—*
Baptista, John L.; Rauner, Frederick J.; and Ford, John A., Jr., 3,699,135.
Ford Motor Company: *See—*
Berry, James I., 3,698,250.
Dickie, Ray A.; and Labana, Santokh S., 3,699,185.
Gilchrist, Allan E., 3,699,030.
Gropp, Karl H., 3,698,366.
Forkardt, Paul, Kommanditgesellschaft: *See—*
Scharfen, Hans; and Steinberger, Josef, 3,698,729.
Forman, Willey G. Burglar alarm. 3,698,352, Cl. 116-86.000.
Forrester, Harold C.; and Tatum, Harold E., to Louisville Bedding Company. Wrap-around mechanism for the stop motion means of a multi-needle sewing machine. 3,698,335, Cl. 112-243.000.
Forster, Franz; Krusche, Alfred; and Hantelmann, Gunter, to Linde Aktiengesellschaft. Pressure-regulating valve. 3,698,415, Cl. 137-102.000.
Forster, Herbert: *See—*
Maylandt, Helmut; Forster, Herbert; and Juhasz, Josef, 3,699,410.
Fortin, Marcel: *See—*
Townsend, Eric Jean; and Fortin, Marcel, 3,698,778.
Foss, Warren M., to NL Industries, Inc. Photoconductive titanium dioxide material. 3,698,894, Cl. 96-1.500.
Foster, Raymond O. Method and article for detecting the fertile period. 3,699,005, Cl. 195-103.50r.
Foxboro Company, The: *See—*
McNabb, George C., 3,698,245.
Francis, John P. Retractable window case structure and support therefor. 3,698,143, Cl. 52-29.000.
Franckowiak, Sigismond: *See—*
Avrillon, Rene; Franckowiak, Sigismond; Gatellier, Claude; and Glikmans, Georges, 3,698,998.
Frank, Lee F., to Eastman Kodak Company. Operator responsive programmed learning apparatus. 3,698,100, Cl. 35-9.00a.
Frank, Simon: *See—*
Firth, William Charles, Jr.; and Frank, Simon, 3,699,094.
Frank, Willi; and Gengler, Gustav. Annular radiator. 3,698,473, Cl. 165-51.000.
Franko, Bernard Vincent: *See—*
Beauchamp, Robert Owens, Jr.; Ward, John Wesley; and Franko, Bernard Vincent, 3,699,230.
Franz, John E., to Monsanto Company. 3-Aryl-isothiazole-4,5-dicarboxylates. 3,699,115, Cl. 260-302.00a.
Franzel, Irwin H. Energy transmission apparatus. 3,698,397, Cl. 128-399.000.
Frawley Enterprises, Inc.: *See—*
Sears, Hartley M.; and Schrader, Clarence O., 3,698,825.
Frayssinoux, Roland Francois Edouard, to Compagnie des Compteurs. Method for remote reading successive data of various apparatuses and device for operating the same. 3,699,520, Cl. 340-150.000.
Frederickson, Robert Eugene; Zimmerer, John Louis; and Bailey, Jay Richard, to McCulloch Corporation. Vibration isolation and bumper system. 3,698,455, Cl. 143-32.00r.
Free, Marvin H.: *See—*
Wood, Loren E.; and Free, Marvin H., 3,698,598.
Freed, Jacob B.; and Reiling, Victor G., to Union Pump Company. Lined plug valve. 3,698,422, Cl. 137-375.000.
Freedman, Morris David, to Bendix Corporation, The. Coordinate determining device employing a second order difference signal to determine approximate cursor position. 3,699,253, Cl. 178-19.000.
Freeport Sulphur Company: *See—*
Jolly, Jatinder, 3,698,862.
Fremont, Howard J., to Marine Protein Corporation. Floating fish enclosure. 3,698,359, Cl. 119-3.000.
French, Robert L. Paint brush trim guide. 3,698,033, Cl. 15-246.000.
Fried, Robert. Cradiac rhythm computer device. 3,698,386, Cl. 128-2.06a.
Friedrich Maurer Soehne, Firma: *See—*
Koester, Waldemar, 3,698,292.
Fritz, William Baird; and Hudson, William Jeffrey, Jr., to AMP Incorporated. Filter for a video amplifier. 3,699,272, Cl. 179-170.00f.
Frost, William Thomas, to International Business Machines Corporation. Wideband frequency modulation communications system. 3,699,447, Cl. 325-45.000.
Fuji Photo Film Co., Ltd.: *See—*
Ohkubo, Kinji; Noguchi, Junpei; and Masuda, Takao, 3,699,114.
Fujie, Kuniyoshi: *See—*
Yamasaki, Masaaki; Fujie, Kuniyoshi; and Fukui, Haruo, 3,699,224.
Fujii, Setsuro: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.
Fujimura, Tsutomu: *See—*
Shigematsu, Hiroji; Yamaguchi, Tomio; Fukue, Hisanobu; Ogawa, Hiroshi; Hashimoto, Takashi; Murakoshi, Kenichi; Suguri, Susumu; and Fujimura, Tsutomu, 3,699,436.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Arima, Kei; Tamura, Gakuzo; Imanaka, Hiroshi; Kousaka, Masanobu; and Fukuda, Akio, 3,699,121.
Umio, Suminori; and Maeno, Shizuo, 3,699,125.
Fujitsu Limited: *See—*
Kiyasu, Zen'Iti; Kawashima, Masao; Sasaki, Shunroku; Mineshima, Yukihiko; and Kurita, Shyoichi, 3,699,567.
Fukaya, Shigeo; and Takagi, Nobuo. Apparatus for optionally selecting thrust force applied to the workpieces in the friction welding. 3,698,617, Cl. 228-2.000.
Fukuda, Akio: *See—*
Arima, Kei; Tamura, Gakuzo; Imanaka, Hiroshi; Kousaka, Masanobu; and Fukuda, Akio, 3,699,121.
Fukue, Hisanobu: *See—*
Shigematsu, Hiroji; Yamaguchi, Tomio; Fukue, Hisanobu; Ogawa, Hiroshi; Hashimoto, Takashi; Murakoshi, Kenichi; Suguri, Susumu; and Fujimura, Tsutomu, 3,699,436.
Fukui, George M.: *See—*
Ludwig, Bernard J.; Berger, Frank M.; and Fukui, George M., 3,699,097.
Fukui, Haruo: *See—*
Yamasaki, Masaaki; Fujie, Kuniyoshi; and Fukui, Haruo, 3,699,224.
Fukui, Hisaaki; and Araki, Taketoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Composition for developing photopolymerizable lithographic plate elements comprising a developer base agent, an ink-receptivity-affording agent and a desensitizer. 3,698,904, Cl.96-48.000.
Fukuoka, Tatsuo. Footwear. 3,698,107, Cl. 36-11.500.
Fukushi, Saburo: *See—*
Koyano, Takashi; and Fukushi, Saburo, 3,699,174.
Fulcher, Edwin Maxwell: *See—*
Madrazo, Charles Felix; Fulcher, Edwin Maxwell; and McDonagh, Kevin Patrick, 3,699,355.
Fuller, Giles A.: *See—*
Meriano, Albert P.; Fuller, Giles A.; and Knuth, William H., 3,698,507.
Funabashi, Shoichi: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.
Funk, R., & Co., Inc.: *See—*
Funk, Rudolph; and Funk, Roger S., 3,698,705.
Funk, Roger S.: *See—*
Funk, Rudolph; and Funk, Roger S., 3,698,705.
Funk, Rudolph; and Funk, Roger S., to Funk, R., & Co., Inc. Apparatus for folding flexible sheets. 3,698,705, Cl. 270-67.000.
Furgal, Henry P.: *See—*
Grand, Paul S.; Falivene, Pasquale Joseph; and Furgal, Henry P., 3,698,095.
Furuichi, Masayoshi, to Katsuragawa Denki Kabushiki Kaisha. Method and apparatus for supplementing toner in electrophotographic machines. 3,698,926, Cl. 117-17.500.
Furukawa Electric Company Limited, The: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakazima, Jun, 3,698,652.
Fuzesi, Stephen; and Lapkin, Milton, to Olin Corporation. Polyurethane foams prepared from oxypropylated and higher oxyalkylated starch-phosphorus-containing polyethers. 3,699,060, Cl. 260-2.5ar.
Gaddis, Kenneth W.: *See—*
Boots, Patrick R.; and Gaddis, Kenneth W., 3,698,135.

Gaertner, George W., to Shell Oil Company. Process for the production of dimethyl 1-methyl-2-(methylcarmoyl) vinyl phosphate. 3,699,194, Cl. 260-969.000.
GAF Corporation: *See—*
Randall, David I.; and Vogel, Calvin, 3,699,195.
Gagneun, Andre; Brandstrom, Arne Elof; and Carlsson, Stig Ake Ingomar, to Ciba-Geigy Corporation. 2-Benzoyl indole derivatives. 3,699,124, Cl. 260-326.150.
GaLasso, Francis S.; Jacob, Bernarr A.; and Pinto, Jane P., to United Aircraft Corporation. Method of strengthening silicon carbide coated boron filaments. 3,698,970, Cl. 156-3.000.
Garde, Douglas: *See—*
Martin, Edward Albert; and Garde, Douglas, 3,699,458.
Gardner, Robert E., to United States of America, Navy. Signal spectrum generator. 3,699,435, Cl. 324-57.00r.
Gardziella, Arno, to Dynamit Nobel Aktiengesellschaft. Hot melt adhesives comprising C_8 to C_{12} aliphatic dicarbolic acid modified phthalic acid polyester mixture. 3,699,187, Cl. 260-860.000.
Garin, Jose Ignacio Martinez: *See—*
Sejournet, Jacques; and Garin, Jose Ignacio Martinez, 3,698,070.
Garrett, Donald E.; and Sass, Allan S., to Occidental Petroleum Corporation. Continuous process for the conversion of carbonaceous solids into pipeline gas. 3,698,882, Cl. 48-210.000.
Garrett, William R., to Smith International, Inc. Kelly foot valve. 3,698,411, Cl. 137-71.000.
Garriott, Louis B., Jr.: *See—*
Morkoski, James; and Garriott, Louis B., Jr., 3,698,486.
Garriques, Alfred L.: *See—*
Cvacho, Daniel S.; Fastabend, Patrick A.; Garriques, Alfred L.; and Jensen, Eric L., 3,698,593.
Gartner, Robert. Screw drive. 3,698,258, Cl. 74-424.800.
Garzotto, Felice, to Rimar S.p.A. Machine for washing and treating with finishing agents yarns of natural, artificial and synthetic fibers wound on a reel. 3,698,211, Cl. 68-19.200.
Gasc, Jean-Claude: *See—*
Nedelec, Lucien; and Gasc, Jean-Claude, 3,699,100.
Gaspar, Bela. Method of producing colloid relief images. 3,698,902, Cl. 96-35.000.
Gastin, Darrell L., to Goodyear Tire and Rubber Company, The. Valve assembly. 3,698,428, Cl. 137-595.000.
Gastler, John H.: *See—*
Beane, David J.; and Gastler, John H., 3,698,186.
Gatellier, Claude: *See—*
Avrillon, Rene; Franckowiak, Sigismond; Gatellier, Claude; and Glikmans, Georges, 3,698,998.
Gates Rubber Company, The: *See—*
Kesinger, Donald, 3,698,131.
Gaudin, Jean Joseph, to LABAZ. Balance for blood bag. 3,698,494, Cl. 177-118.000.
Gaul, James M.: *See—*
Benkeser, Robert A.; and Gaul, James M., 3,699,143.
Geddings, Arthur J. Chaise lounge. 3,698,764, Cl. 297-356.000.
Gehlen, Hermann Walter. Amphibious vehicle. 3,698,350, Cl. 115-1.00r.
Geigy Chemical Corporation: *See—*
Gubler, Kurt; Meyer, Urs; and Brechbuhler, Hans Ulrich, 3,699,225.
Schindler, Walter; Schmid, Erich; and Zust, Armin, 3,699,104.
Schindler, Walter; Schmid, Erich; and Zust, Armin, 3,699,107.
General Connectors Corporation: *See—*
Greenwald, Fred A., 3,698,727.
General Dynamics Corporation: *See—*
Bielefeld, Ewald J., Jr.; and Puma, Maurice J., 3,698,867.
General Electric Company: *See—*
Ashley, Eugene; Tassie, Douglas P.; and Seemann, James M., 3,698,283.
Berner, Warren E., 3,698,080.
Finch, Thomas Ellwood, 3,699,306.
Grout, Stephen, 3,699,467.
Hale, Thomas E., 3,698,878.
Joseph, Raymond S.; and Kemeny, Julius, 3,699,580.
Joynson, Reuben E.; and Mundy, Joseph L., 3,699,544.
Mapother, Thomas C.; and Wilson, Richard L., 3,699,406.
Mc Cann, Joseph A.; and Harnden, John D., Jr., 3,699,402.
Pitha, John J., 3,698,920.
Quillinan, John H.; and Mackey, Edward F., 3,699,341.
Redington, Rowland W., 3,698,078.
Smith, Dallas F., 3,698,063.
Vrabeli, Edward A.; and Cuzzone, Raymond, 3,699,491.
General Foods Corporation: *See—*
Woodruff, George M.; Stoeckli, Oscar W.; and Shando, Joseph G., 3,698,154.
General Industries, Inc.: *See—*
Grenier, Wilfred J., 3,698,684.
General Metors Corporation: *See—*
Maginnis, George B., 3,698,834.
General Motors Corporation: *See—*
Addie, Albert N., 3,699,351.
Dunn, Joseph B., 3,698,781.
Markey, Francis J., 3,698,236.
McLean, William E., 3,699,546.
Reeves, Keith Clarkson, 3,698,259.
Schlotterbeck, David L.; and Briar, John R., 3,698,204.
Shellhause, Ronald L., 3,698,260.
General Refractories Company: *See—*
Staut, Ronald; and Judd, George G., 3,698,922.
General Signal Corporation: *See—*
Haner, Robert B., Jr., 3,699,522.
Hughson, J Donald, 3,699,521.
General Signal Corporations: *See—*
Dobrowolski, Zbigniew C., 3,698,515.
General Tire & Rubber Company, The: *See—*
Hipsher, Gary L., 3,698,703.
Gengler, Gustav: *See—*
Frank, Willi; and Gengler, Gustav, 3,698,473.
Gensler, Walter J., to United States of America, Agriculture. Synthesis of methyl malvalate and methyl 5,6-methano-5-undecenoate. 3,699,146, Cl. 260-464.000.
Gentit, William F., to Stauffer Chemical Company. Functional fluid antioxidants. 3,699,053, Cl. 252-403.000.
Geraci, James L.: *See—*
Walchle, David L.; Smith, Russell G.; and Geraci, James L., 3,698,791.
Gerard, Henry M., to Hughes Aircraft Company. Acoustic surface wave device having improved transducer structure. 3,699,364, Cl. 310-9.800.
Gericke, Otto R., to United States of America, Army. Electronic circuit for prevention of receiver paralysis in ultrasonic echo ranging. 3,698,240, Cl. 73-67.900.
Gerin, Paul; Louat, Lucien; and Quillet, Jean-Pierre, to Progil. Production of carbon disulphide from hydrocarbons. 3,699,215, Cl. 423-443.000.
Gerth, Donald L.: *See—*
Maag, Gustav A.; and Gerth, Donald L., 3,698,097.
Geshner, Robert A.: *See—*
Dodd, John A., Jr.; and Geshner, Robert A., 3,698,903.
Gesner, Bruce David: *See—*
De Fabritis, Raymond P.; Fefferman, Gerald Burt; Gesner, Bruce David; and Radner, Raymond John, 3,699,552.
Gestra-KSB Verlriebsgesellschaft mbH & Co.: *See—*
Lingnau, Josef, 3,698,633.
Geusgens, Joseph T. V. M.: *See—*
Heijnis, James W. I.; and Geusgens, Joseph T. V. M., 3,698,355.
Geyer, Harry J.: *See—*
Helda, Robert W.; and Geyer, Harry J., 3,698,074.
Geyer, Harry J.; and Helda, Robert W., to Motorola, Inc. Apparatus for connecting lead portions of a lead frame to respective pads on a chip. 3,698,620, Cl. 228-6.000.
Ghose, Rabindra N.; and Sauter, Walter A., to American Nucleonics Corporation. Interference cancellation system. 3,699,444, Cl. 325-21.000.
Giaimo, Edward Charles, Jr., to RCA Corporation. Apparatus for charging a recording element with an electrostatic charge of a desired amplitude. 3,699,335, Cl. 250-49.5zc.
Gibbons, Arthur S.: *See—*
Midulla, Guiseppe, 3,699,046.
Giberstein, Bernard, to Begy Societe Europeenne de Bas sans Couture. Method of manufacture of printed articles, in particular printed knitted articles. 3,698,899, Cl. 96-27.000.
Gibson, Earl D., to North American Rockwell Corporation. Automatic adaptive equalizer implementation amenable to MOS. 3,699,321, Cl. 235-152.000.
Giddings & Lears, Inc.: *See—*
Skabunde, Steven Eldor, 3,698,725.
Gie, Ong Tjing: *See—*
La Grouw, Coenraad Maria; and Gie, Ong Tjing, 3,698,921.
Gier, Delta W.; and Wasleski, Daniel M., to Baychem Corporation, mesne. Ethers of dicarboxylic acids. 3,699,150, Cl. 260-471.00r.
Gier, Delta W.; and Calhoon, Audra M., to Chemagro Corporation. Process of killing fungi with acetylenic ketones. 3,699,232, Cl. 424-331.000.
Gierlichs, Michael: *See—*
Baum, Wilhelm; and Gierlichs, Michael, 3,698,917.
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., to Mayer, Oscar, & Co., Inc. Method of producing laminated film for packaging use. 3,698,979, Cl. 156-244.000.
Gilbert, Arthur E., to Sears, Roebuck and Co. Outboard motor mounting bracket. 3,698,672, Cl. 248-4.000.
Gilbert, Roswell W., to Technical Management Services, Inc. Magnetic support and motor structure. 3,698,775, Cl. 308-10.000.
Gilchrist, Allan E., to Ford Motor Company. Process for electrodepositing paint. 3,699,030, Cl. 204-181.000.
Gillemot, George W.: *See—*
Anderson, Karl R., 3,699,284.
Thompson, John T.; and Gillemot, George W., 3,699,494.
Gillette Company, The: *See—*
Nigro, Louis V., 3,698,604.
Gillette, Erwin H. Silage distributor. 3,698,576, Cl. 214-17.00c.
Gillies, George Marshall; and Littlechild, James, to United Kingdom Atomic Energy Authority. Rotary kilns. 3,698,697, Cl. 263-32.00r.
Gilligan, William H.; and McQuistion, William E., to United States of America, Navy. Preparation of certain difluoroamino compounds. 3,699,168, Cl. 260-583.0nh.
Givaudan Corporation: *See—*
Bertele, Erhard; and Schudel, Peter, 3,699,169.
Glaesmann, Otto-Ernst: *See—*
Jankowski, Alfons; Glaesmann, Otto-Ernst; and Haake, Gerhard, 3,698,196.
Glander, Fritz: *See—*

Matthieu, Paul; Leuchs, Ottmar; Glander, Fritz; Kuypers, Hubert; and Pelz, Diethart, 3,698,440.

Glanzsoff A.G.: *See—*
Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, 3,699,161.

Glaser, Ronald A.: *See—*
Mihojevich, Steven; Zerfans, Arthur S.; Ostensen, Ralph G.; Berggren, Albin F., Jr.; and Glaser, Ronald A., 3,698,706.

Glasgow, Colin F., to Pate Foods, Inc., mesne. Method for making potato chip-type food product. 3,698,915, Cl. 99-100.00p.

Glass, Marvin, & Associates: *See—*
Breslow, Jeffrey D., 3,698,714.

Glassman, Jacob A. Packages for small articles. 3,698,549, Cl. 206-63.20r.

Glikmans, Georges: *See—*
Avrillon, Rene; Franckowiak, Sigismond; Gatellier, Claude; and Glikmans, Georges, 3,698,998.

Glolok Co., Ltd.: *See—*
Lieberman, Abraham Buddy, 3,698,153.

Gnage, Oliver W., to Eastman Kodak Company. Gravity-fed storage device. 3,698,602, Cl. 221-225.000.

Gno, Franklin, Corporation: *See—*
Cohen, Martin J.; Carroll, David I.; Wernlund, Roger F.; and Kilpatrick, Wallace D., 3,699,333.

Goddard, David: *See—*
Scales, John Tracey; and Goddard, David, 3,698,017.

Golay, Marcel J. E.; and Waite, Amory H., Jr. Method and means for the water transport of liquids. 3,698,339, Cl. 114-16.00r.

Gold, Harold E.; and Smith, Ralph B., to American Air Filter Company, Inc. Thermal effect reclaim device. 3,698,472, Cl. 165-6.000.

Gomoll, Timothy J.: *See—*
Cummings, John P.; and Gomoll, Timothy J., 3,698,643.

Gompf, Thomas E.; and Lum, Kin Kwong, to Eastman Kodak Company. Diffusion transfer processes and film units comprising compounds which are cleavable upon oxidation in alkali media to produce diffusible dyes or dye precursors. 3,698,897, Cl. 96-3.000.

Goodman, Ernest A.; and Handerhan, Joseph P., to Allis-Chalmers Corporation. Distribution transforr having static shield. 3,699,488, Cl. 336-84.000.

Goodman, Martin M., to Columbia Belford Inc. Sliding structure roller assembly. 3,698,036, Cl. 16-100.000.

Goodrich, B. F., Company, The: *See—*
Carbonaro, Antonio; Greco, Alberto; Asta, Gino Dall; and Cameli, Nazzareno, 3,699,088.
Matthews, Harry P., 3,698,971.
Niemann, Theodore F., 3,699,191.
Siebert, Alan R., 3,699,153.
Stockman, Charles H., 3,699,067.

Goodrich, Robert S. Telephone disconnect device. 3,699,270, Cl. 179-158.000.

Goodridge, Walter R., to Electrostatic Equipment Corporation. Apparatus for producing hollow articles. 3,698,847, Cl. 425-174.000.

Goodwin, Orval L., to Allan Pump and Supply, Inc. Gas carburetor valve. 3,698,367, Cl. 123-120.000.

Goodyear Aerospace Corporation: *See—*
Baker, Ronald E.; Fogarty, Robert L.; and Slagel, Edwin C., 3,698,587.

Goodyear Tire & Rubber Company, The: *See—*
Braden, William D.; Marshall, Richard P.; Greenhorn, Richard J.; and Buser, Arnold S., 3,698,233.
Jacobs, Paul F., 3,698,462.
Kuhar, George A., 3,699,023.
Okuzumi, Yuzi, 3,699,083.
Parkinson, Alan R., 3,699,166.
Sawyer, John M., 3,698,927.
Scheibelhoffer, Anthony S., 3,699,063.
Woodhall, Edwin S.; Appleby, Paul F.; and Touchette, John W., 3,698,987.

Goodyear Tire and Rubber Company, The: *See—*
Crossman, Richard L., 3,698,519.
Downey, Raymond E., 3,699,189.
Gastin, Darrell L., 3,698,428.
Johnson, Ernest D., 3,698,535.
Robinson, Keith D., 3,699,198.

Gordon, George E.; and Landrum, Leon L. Baseball equipment storage rack. 3,698,563, Cl. 211-13.000.

Gordon, Howard W.; and Shepard, James N., to United States Steel Corporation. Strip accumulator. 3,698,613, Cl. 226-118.000.

Gorman, Wayne D. Motor cycle back rests. 3,698,762, Cl. 297-195.000.

Goto, Kenjiro. Gas burner nozzle for use in a gas lighter. 3,698,851, Cl. 431-266.000.

Gotshall, William W., to Marathon Oil Company. Finely divided carbon and the preparation thereof. 3,699,216, Cl. 423-449.000.

Goujard, Marie Pierre, to Compagnie Gervais Danone Hauts de Seine. Manufacture of cheese curd. 3,698,918, Cl. 99-116.000.

Goulet, Roger T.; and Zednik, Ernest R., to Cambridge Filter Corporation. Method of sealing filter cores to frame members. 3,698,984, Cl. 156-293.000.

Gouttierre, Jean, to Ateliers de Constructions Electriquer de Charleroi (ACEC). Guide beam for plural carriages equipped with driving motors. 3,698,270, Cl. 83-11.000.

Goyarts, Wynand M.J.M., to Clark Equipment Company. Van carrier vehicle. 3,698,581, Cl. 214-394.000.

Goyne Pump Company: *See—*
Goyne, Thomas S., 3,698,830.

Goyne, Thomas S., to Goyne Pump Company. Vertical centrifugal suction pump. 3,698,830, Cl. 415-111.000.

Grabe, Christiaan Albertus Johannes: *See—*
Weststrate Jan; and Grabe, Christiaan Albertus Johannes, 3,699,220.

Graber-Rogg, Inc.: *See—*
Martin, Harold B.; and Rogg, Herman O., 3,698,276.

Grace, W. R., & Co.: *See—*
Kehr, Clifton L.; and Wszolek, Walter R., 3,699,084.
Patil, Arvind S.; and Ashby, George E., 3,698,891.
Thunberg, Jon C.; and Philbrook, James E., 3,699,214.
Velten, Terrance J., 3,698,859.

Graco Inc.: *See—*
Szasz, Imre, 3,698,636.

Grakauskas, Vytautas, to Aerojet-General Corporation. Synthesis of tetrafluorohydrazine. 3,698,864, Cl. 23-205.000.

Grand, Paul S.; Falivene, Pasquale Joseph; and Furgal, Henry P., to Colgate-Palmolive Company. Fiber conditioning article. 3,698,095, Cl. 34-9.000.

Grand, Stanley: *See—*
Ehrlich, Melvin P.; Stoller, Milton; and Grand, Stanley, 3,699,336.

Grant, Lewis F., to Clark Equipment Company. Vehicle suspension. 3,698,737, Cl. 280-112.000.

Graser, Earl J., to Olinkraft, Inc. Crown-support carrier. 3,698,550, Cl. 206-65.00e.

Graser, Earl J., to Olinkraft, Inc. Article carrier handle. 3,698,625, Cl. 229-52.00b.

Grassetti, Davide R.; and Murray, John F., Jr., to Arequipa Foundation. Spectrophotometric method and reagents for quantitative determination of thiols. 3,698,866, Cl. 23-230.00r.

Grasshoff, J. Michael; and Taylor, Lloyd D., to Polaroid Corporation. Photographic products and processes employing a compound which in the presence of alkali released a diffusible photographic reagent. 3,698,898, Cl. 96-3.000.

Grassmuck, August W. T. Clutch and throttle control. 3,698,525, Cl. 192-.075.

Gray, Frederick Martin: *See—*
Paddison, Eric; Wilson, Christopher George; and Gray, Frederick Martin, 3,699,431.

Grebow, Wolfe. Animated toy. 3,698,126, Cl. 46-119.000.

Greco, Alberto: *See—*
Carbonaro, Antonio; Greco, Alberto; Asta, Gino Dall; and Cameli, Nazzareno, 3,699,088.

Greco, Thomas E. Styling valet. 3,698,404, Cl. 132-79.000.

Green, Gary W.: *See—*
Fitting, Samuel E.; and Green, Gary W., 3,698,509.

Green, Lawrence E.; and McDermott, William G., to McDermott & Green, Inc. Variable displacement holder. 3,698,132, Cl. 47-41.130.

Greenberger, Joseph Irwin; and Ciochetto, Joseph James, to United Engineering and Foundry Company. Dummy bar handling system. 3,698,469, Cl. 164-274.000.

Greenhorn, Richard J.: *See—*
Braden, William D.; Marshall, Richard P.; Greenhorn, Richard J.; and Buser, Arnold S., 3,698,233.

Greenough, Maurice Leighton; and Kuder, Milton L., to United States of America, Commerce. Method and machine for reading handwritten cursive characters. 3,699,518, Cl. 340-146.30z.

Greenwald, Fred A., to General Connectors Corporation. Distortable seal ring. 3,698,727, Cl. 277-153.000.

Gregoli, Armand A.; and Mounce, William R., to Cities Service Research & Development Company. Vapor liquid separation apparatus. 3,698,876, Cl. 23-288.00e.

Grenier, Wilfred J., to General Industries, Inc. Stem sealing for valving. 3,698,684, Cl. 251-214.000.

Greskovics, Paul, to Litton Business Systems, Inc. Business machine. 3,698,628, Cl. 235-60.00r.

Griefiths, Graham Ernest: *See—*
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griefiths, Graham Ernest, 3,698,562.

Grier, John D., to Owens-Illinois, Inc. Method for image transfer. 3,698,314, Cl. 101-426.000.

Griffin, Philip Alfred, to Dow Corning Limited. Method for bonding cured siloxane resin surface. 3,698,982, Cl. 156-308.000.

Griffith, Richard A., to Park-Ohio Industries, Inc. Single turn channel coil. 3,699,302, Cl. 219-10.570.

Grimm, Peter, to Metallgesellschaft Aktiengesellschaft. Automatic temperature control system for extruders for molten material. 3,698,844, Cl. 425-144.000.

Grin, Michel; and Marchal, Francois, to European Atomic Energy Community (Euratom). Centering plug for magnetic welding a plug in the end of a tube. 3,699,297, Cl. 219-9.500.

Grindrod, Paul E.: *See—*
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 3,698,979.

Griswold, Augustus W.; and Haritonoff, Boris W., to Keystone Micro-Scan, Inc., mesne. Variable film-width microfilm trimmer. 3,698,275, Cl. 83-481.000.

Groeber, Eugen, to Sperry Rand Corporation. Pneumatic roll device for document handling apparatus. 3,698,538, Cl. 198-33.0ad.

Grogan, Daniel R. Float-sinker. 3,698,120, Cl. 43-43.140.

Gronka, Edward Anthony, to RCA Corporation. High voltage processing of cathode ray tubes. 3,698,786, Cl. 316-26.000.

Gropp, Karl H., to Ford Motor Company. Engine spark timing control system. 3,698,366, Cl. 123-117.00a.

Gropper, Lee: *See—*
Stahl, Lawrence E.; and Gropper, Lee, 3,699,287.
Gross, Eshcol Silas. Power-operated dolly. 3,698,501, Cl. 180-8.00a.
Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Lateral abutment devices for vehicle windows. 3,698,136, Cl. 49-394.000.
Grotz, Norman; and Maccarone, Michael B. Pressurized dispenser. 3,698,595, Cl. 220-63.00r.
Grout, Stephen, to General Electric Company. Bias circuit for a complementary transistor output stage. 3,699,467, Cl. 330-17.000.
Groves, Malcolm D., to Combustion Engineering, Inc. Gripper device having positive engaging and disengaging means. 3,698,756, Cl. 294-96.000.
Growney, Lawrence J., to Continental Can Company, Inc. Book-type carton. 3,698,544, Cl. 206-45.110.
Grumman Aerospace Corporation: *See—*
Markow, Edward G., 3,698,461.
Grundy, Douglas; and Wills, John E., to United States of America, Navy, mesne. Drain valve having auxiliary seal. 3,698,420, Cl. 137-329.060.
Grundy, Reed H., to Westinghouse Air Brake Company. Propulsion control system for self-propelled two-car trains. 3,698,325, Cl. 105-61.000.
Grunig, James K.; Davis, William B.; and Aitkenhead, William C., to Anaconda Company, The. Extraction of beryllium from ores. 3,699,208, Cl. 423-132.000.
Grunwald, John J.: *See—*
Mersereau, Mark; Rohdenizer, Harold L.; Grunwald, John J.; and Innes, William P., 3,698,940.
GTE Automatic Electric Laboratories, Inc.: *See—*
Rogers, Robert G., 3,699,475.
GTE Automatic Electric Laboratories, Incorporated: *See—*
Pitroda, Satyan G.; and Rekiere, Bernard J., 3,699,264.
Reimer, William A.; and Storz, Frederick G., 3,698,058.
Reimer, William A., 3,699,393.
GTE Labatories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Kruzewski, William Frank; and Siwko, Karol, 3,699,455.
Guarino, Henry R.: *See—*
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Gubler, Kurt; Meyer, Urs; and Brechbuhler, Hans Ulrich, to Geigy Chemical Corporation. Control of insects and acarinal with certain pyridyl-thiazoline phosphates and the corresponding phospharothioates. 3,699,225, Cl. 424-200.000.
Gubner, Richard S.: *See—*
Schole, Murry L.; and Gubner, Richard S., 3,699,221.
Gudmundsen, Austin. Golf ball retriever. 3,698,720, Cl. 273-162.00e.
Guedel, Arthur R., to Guedel Company Inc. Elbow locking device. 3,698,389, Cl. 128-77.000.
Guedel Company Inc.: *See—*
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Guerin, Ernest P., to Stevens, J. P., & Co., Inc. Continuous fringe cutter for fabrics woven without weft locked selvages. 3,698,447, Cl. 139-303.000.
Guest, Ashley W.: *See—*
Thompson, Raymond; and Guest, Ashley W., 3,699,479.
Guillot, Joseph M., Jr.: *See—*
Burke, Jack J.; and Guillot, Joseph M., Jr., 3,698,621.
Gulf & Western Industries, Inc.: *See—*
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Gulf Research & Development Company: *See—*
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Gunsalus, Claude A.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.
Gunther, Phillip B.: *See—*
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Gurtler, Richard W.; and Saltich, Jack L., to Motorola, Inc. Electro-optical coupled-pair using a Schottky barrier diode detector. 3,699,407, Cl. 317-235.00r.
Guyette, Frank L.: *See—*
Hickey, Lionel R.; and Guyette, Frank L., 3,698,805.
Gyori, Louis. Electrical control system. 3,699,414, Cl. 318-139.000.
Gyurk, Warren Joseph: *See—*
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Haake, Gerhard: *See—*
Jankowski, Alfons; Glaesmann, Otto-Ernst; and Haake, Gerhard, 3,698,196.
Hadfield, Glen R. Means for consecutively gathering separated rolls of sod and continuously elevating the same to the level of an accompanying vehicle. 3,698,534, Cl. 198-9.000.
Haferkamp, Wilhelm: *See—*
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Hagemann, Hermann, to Farbenfabriken Bayer Aktiengesellschaft. Reaction of phosgene and cyanogen chloride. 3,699,162, Cl. 260-544.00c.
Halat, John A.: *See—*
Ellis, Gaylord O.; and Halat, John A., 3,698,286.
Haldeman, Charles W.; and Basmajian, Vahan V., to Megatech Corporation. Transparent internal combustion engine. 3,698,370, Cl. 123-193.0cp.
Hale, Thomas E., to General Electric Company. Sintered tungsten carbide-base alloys. 3,698,878, Cl. 29-182.700.
Halgren, Phyllis Mott: *See—*
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Halko, John J., Sr.; and Halko, Andrew R. Lubrication. 3,699,057, Cl. 252-49.300.
Hall, Charles H.; Young, Albert L.; and Young, N Keith, to TRW Inc. Large area deployable spacecraft antenna. 3,699,581, Cl. 343-705.000.
Hall, George L.: *See—*
Brown, Ray B.; Fluhr, Frederick R.; and Hall, George L., 3,698,797.
Hall, Lou H., to Texas Instruments, Incorporated. Method and device employing high resistivity aluminum oxide film. 3,698,071, Cl. 29-571.000.
Hall, Raymond Frederick; and Mainard, Douglas Raymond, to U.S. Philips Corporation. Glow discharge display device including an insulating envelope block with an array of cavities therein. 3,699,377, Cl. 313-204.000.
Hallberg, John E., to Industrial Propane, Inc. Diesel booster. 3,698,365, Cl. 123-121.000.
Halliburton Company: *See—*
Zimmerman, Carl W.; and Copland, George V., 3,699,319.
Hamai Demkyu Kogyo Kabushiki Kaisha: *See—*
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Hamai, Jituo, to Hamai Denkyo Kogyo Kabushiki Kaisha. Manufacturing method for small electric lamps. 3,698,785, Cl. 316-19.000.
Hamamoto, Masao; Kamo, Seiichi; and Nakayama, Kiyoshi, to Mitsubishi Chemical Industries Limited. Process for producing slow-acting potassium phosphate fertilizers. 3,698,885, Cl. 71-1.000.
Hamilton, William R., Jr., to Portec, Inc. Insulated rail joints. 3,698,634, Cl. 238-152.000.
Hand, Hi. Brassiere. 3,698,399, Cl. 128-483.000.
Handerhan, Joseph P.: *See—*
Goodman, Ernest A.; and Handerhan, Joseph P., 3,699,488.
Haner, Robert B., Jr., to General Signal Corporation. Locomotive radio control system with address and command signals. 3,699,522, Cl. 340-171.00r.
Hanff, Michel Max; and Chambolle, Stephane, to Compagnie des Compteurs. Apparatus for measuring the transmissive power of the atmosphere employing two transmitters and receivers. 3,698,820, Cl. 356-206.000.
Hanke, Walter: *See—*
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Hannon, Warren W.; and Hannon, Charles N. (said Hannon, C. N., assor. to), 3,698,704.
Hannon, Warren W.; and Hannon, Charles N., said Hannon, C. N., assor. to Hannon, W. N. Folded newspaper opening mechanism for multiple section inserting machine. 3,698,704, Cl. 270-57.000.
Hansen, A. L., Mfg. Co.: *See—*
Bowers, Thomas S., 3,698,678.
Hansen, Clarence M., to Michigan State University, Board of Trustees of. Tank wagon. 3,698,730, Cl. 280-5.00e.
Hansen, Theodore E.; and Wilson, Floyd A., to Anaconda Wire and Cable Company. Flexible power cable. 3,699,238, Cl. 174-115.000.
Hanson, Donald W.; and Mifflin, Ralph W., to United States of America, Air Force. Tacan ground station track and display system. 3,699,570, Cl. 343-6.00r.
Hanson, Howard G. Haystack forming device. 3,698,767, Cl. 298-27.000.
Hantelmann, Gunter: *See—*
Forster, Franz; Krusche, Alfred; and Hantelmann, Gunter, 3,698,415.
Hardenbrook, James Maurice: *See—*
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Hardesty, Edwin C.; Krumreich, Charles L.; Mulbarger, Albert E., Jr.; and Walen, Stephen W., to Bell Telephone Laboratories, Incorporated and Western Electric Company, Incorporated. Devices for making electrical connections. 3,699,498, Cl. 339-64.00m.
Hardoiin, Yves: *See—*
Morane, Bruno; Paoletti, Charles; and Hardoiin, Yves, 3,698,453.
Haritonoff, Boris W.: *See—*
Griswold, Augustus W.; and Haritonoff, Boris W., 3,698,275.
Harmgardt, Hans-Lothar, to Northern Electric Company, Limited. Regulating amplifier. 3,699,468, Cl. 330-29.000.
Harmon, Peter E. Speed reading machine. 3,698,103, Cl. 35-35.
Harnden, John D., Jr.: *See—*
Mc Cann, Joseph A.; and Harnden, John D., Jr., 3,699,402.
Harp, Grace E. Doll-like puppet with movable mouth. 3,698,127, Cl. 46-126.000.
Harrah, Robert S.: *See—*
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Harrah, Robert S.; and Kalsi, Manmohan Suigh, said Kalsi assor. to said Harrah, Robert S. Vibration detector. 3,698,351, Cl. 116-70.000.

Harris, John L., to Deltrol Corporation. Manual preset interval timer with latch holding means for contacts. 3,699,281, Cl. 200-38.00r.

Harris, Joseph G.: *See—*
Brandt, Oscar E.; and Harris, Joseph G., 3,698,281.

Harris, Richard H., to International Business Machines Corporation. Catastrophirally buckling compression column switch and actuator. 3,699,296, Cl. 200-67.0db.

Harris, Ronald E., to North American Rockwell Corporation. Processes using a masking layer for producing field effect devices having oxide isolation. 3,698,966, Cl. 148-187.000.

Harris-Paint Company: *See—*
Coffey, Charles A., 3,698,645.

Hart, Elnora Mott: *See—*
Mott, Carl W., 3,698,168.

Hart, Harry Patrick; Kakalec, Robert John; and Walk, Ralph, to Bell Telephone Laboratories, Incorporated. Overvoltage protection of DC to DC converters using ferroresonace. 3,699,424, Cl. 321-11.000.

Harter, James E.; and Rodriguez, Juan A., to Eastman Kodak Company. Automatic illumination control for photographic printing apparatus. 3,698,809, Cl. 355-68.000.

Hartling, Donald C.; Joseph, Hawthorne; and Radin, William, to Mattel, Inc. Animated figure toy. 3,698,125, Cl. 46-118.000.

Hartmann & Braun Aktiengesellschaft: *See—*
Ruse, Alois, 3,698,159.

Harvey, Dennis G., to Allis-Chalmer Manufacturing Company. Spring applied disk brake and handle control for industrial truck. 3,698,504, Cl. 180-52.000.

Harvey, Donald M., to Eastman Kodak Company. Copying device including radiation sensitive members electrically responsive to the reflected image. 3,699,586, Cl. 346-74.00e.

Harwood, Leopold Albert; and Wittmann, Erwin Johann, to RCA Corporation. Amplifier circuits. 3,699,257, Cl. 178-69.5cb.

Harwood, Mervyn Geoffrey; and Schofield, John, to U.S. Philips Corporation. Photo-conductive image intensifiers. 3,699,346, Cl. 250-213.000.

Hascic, Wladimir: *See—*
Schwab, Johann; Buchel, Kurt; Eder, Otto; Hascic, Wladimir; and Marek, Ludwig, 3,698,027.

Hashimoto, Takashi: *See—*
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Hashimura, Tetsuo: *See—*
Umezu, Shiro; Hashimura, Tetsuo; and Sekido, Akira, 3,699,299.

Hass, Robert H.; and Reeg, Cloyd P., to Union Oil Company of California. Hydrocracking nitrogen containing feedstocks. 3,699,036, Cl. 208-111.000.

Hasselblad, Fritz Victor: *See—*
Dahlgren, Lennart Gunnar Oskar, 3,698,773.

Hasselblad, Fritz Victor, Dr.: *See—*
Alfredsson, Alf Ingva, 3,698,305.

Hasslacher, James G. Vacuum still having heat exchange coils and particle means therewith. 3,699,006, Cl. 203-4.000.

Hasson, Harrith M. Surgical closure. 3,698,395, Cl. 128-335.000.

Hatfield, John Rawson: *See—*
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Hatsuse, Toshikazu; Ueda, Hiromi; Ozawa, Shouiti; and Yasuda, Yuh, to Citizen Wch Company Limited. Timebase vibrator assembly. 3,699,412, Cl. 318-128.000.

Haver-Lockard Laboratories: *See—*
Carlson, Arthur, Jr., 3,699,219.

Hawker Siddeley Aviation Limited: *See—*
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Hawley Manufacturing Corporation: *See—*
Overmyer, Robert C.; and Scheel, John R., 3,698,137.

Hawthorne, Vaughn T. Interlocking coupler. 3,698,571, Cl. 213-153.000.

Haynes, Peter, to Shell Oil Company. Carbon dioxide-diepoxide copolymers. 3,699,079, Cl. 260-47.0ep.

Hays, William R.: *See—*
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Heal, David; and Parks, James D., to Westinghouse Learning Corporation. Document handling apparatus. 3,698,709, Cl. 271-88.000.

Heberlein Patent Corporation: *See—*
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Hechenbleikner, Ingenuin A.; Hussar, John F.; Koeniger, Arthur F.; and Bresser, Robert E., to Carlisle Chemical Works, Inc. Sulfur containing esters of substituted hydroxyphenyl-alkanoic acids. 3,699,152, Cl. 260-473.00s.

Hecht, Charles L. Mechanical picker for strawberries. 3,698,171, Cl. 56-331.000.

Heightman, Anthony Norman, to Marconi Company Limited, The. Television equipments for fault indication. 3,699,239, Cl. 178-5.4te.

Heijnis, James W. I.; and Geusgens, Joseph T. V. M., to Aku N.V. Apparatus for coating and/or impregnating a sheet material. 3,698,355, Cl. 118-411.000.

Heijnis, James Watt Ijsbrand: *See—*
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Heikman, Harald Erik: *See—*
Bakke, Jan Magnus; and Heikman, Harald Erik, 3,699,120.

Heimann, Richard F., to Raytheon Company. Digital data selection and display system. 3,699,531, Cl. 340-172.500.

Heinrich, Hans-Walter: *See—*
Reger, Herbert; and Heinrich, Hans-Walter, 3,698,542.

Heintzelman, William J.; and Naiman, Michael I., to Petrolite Corporation. Reaction products of wax-anhydride compounds and alcohol. 3,699,154, Cl. 260-485.00j.

Heinz, David M.: *See—*
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Heit, Allyn Harold: *See—*
Calmon, Calvin; Heit, Allyn Harold; and Helfgott, Theodore, 3,699,039.

Helda, Robert W.: *See—*
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Helda, Robert W., to Motorola, Inc. Contact bonding and packaging of integrated circuits. 3,698,073, Cl. 29-577.000.

Helda, Robert W.; and Geyer, Harry J., to Motorola, Inc. Contact bonding and packaging of integrated circuits. 3,698,074, Cl. 29-626.000.

Helda, Robert W., to Motorola, Inc. Face bonding machine. 3,698,618, Cl. 228-3.000.

Heldt, Carl R. Structural toys. 3,698,123, Cl. 46-29.000.

Helfgott, Theodore: *See—*
Calmon, Calvin; Heit, Allyn Harold; and Helfgott, Theodore, 3,699,039.

Helms, Gerd: *See—*
Brendt, Dieter; Helms, Gerd; and Keunecke, Gerhard, 3,699,008.

Helsley, Grover Cleveland, to Robins, A. H., Company, Incorporated. 4-[1-(ω-Benzoylalkyl)-3-pyrrolidinyl]-2 H-1, 4-benzoxazin-3(4H)-ones. 3,699,105, Cl. 260-244.00r.

Helton, Clyde W. Removable push rod guide for engine assembly. 3,698,060, Cl. 29-200.00p.

Henderson, Craig, to Emerson & Cuming, Inc., mesne. Spray dried product for feed in the manufacture of hollow glass spheres and process for forming said spray dried product. 3,699,050, Cl. 252-317.000.

Henderson, Paul D., to Superior Electric Company, The. Automatic actuator for a drilling machine. 3,698,826, Cl. 408-17.000.

Hendley, Dennis Alfred; and Boersma, Sipko L., to Decca Limited. Angular position sensors. 3,699,558, Cl. 340-196.000.

Henkel & Cie G.m.b.H.: *See—*
Baum, Wilhelm; and Gierlichs, Michael, 3,698,917.

Hennart, Claude: *See—*
Rabussier, Bernard; Mandon, Jean Pierre; and Hennart, Claude, 3,698,974.

Henning, Robert W., to Olin Corporation. Tubular magazine and dispenser therefor. 3,698,115, Cl. 42-49.00r.

Henri, Richaud; and Roussos, Michel, to Compagnie Pechiney. Electrolyte for self-colored anodization of aluminum and alloys. 3,699,019, Cl. 204-58.000.

Henry-Baudot, Jacques, to Kollmorgen Corporation. Series-wave windings for dynamo-electric machines. 3,699,371, Cl. 310-207.000.

Herbage, Bernard S. Hub installing retaining and withdrawing device and method. 3,698,836, Cl. 416-146.000.

Herbert, William, to Black Clawson Company, The. Screening apparatus. 3,698,649, Cl. 241-44.000.

Herbold, Robert J.: *See—*
Buck, Willard E.; Herbold, Robert J.; and Sherman, Randy J., 3,698,514.

Hercules Incorporated: *See—*
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Herden, Robert B., to Singer Company, The. Prismatic font accessing in phototypesetters. 3,698,297, Cl. 95-4.50r.

Hermann, Karl-Heinz; Schneider, Joachim; Rudolph, Hans; and Nawrath, Gunter, to Farbenfabriken Bayer Aktiengesellschaft. High molecular weight polyamides with an improved affinity for acid dyes modified with amino epoxy compound. 3,699,183, Cl. 260-78.00l.

Hermansson, Bo; and Thorborg, Kjeld, to Allmanna Svenska Elektriska Aktiebolaget. Converter connections. 3,699,425, Cl. 321-27.00r.

Herr, John A., to Singer Company, The. Electric scissors. 3,698,086, Cl. 30-228.000.

Hertzsch, Hans B., to Deutsche Spinnereimaschinenbau Insolstadt Niederlasng der Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Can changing in strand material handling. 3,698,041, Cl. 19-159.00a.

Heseltine, Donald W.: *See—*
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Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,699,026.

Hess, Ralph A.; and McNamee, James P., to SW Industries, Inc. High speeroli for machinery. 3,698,053, Cl. 29-132.000.

Hetheringto, Gordon: *See—*
Hutchinson, Eric; and Hetheringto, Gordon, 3,699,308.

Heurtley, John C., to Xerox Corporation. Method of organized thermoplastic xerography and photoreceptor structure therefor. 3,698,893, Cl. 96-1.100.

Heurtley, John Crmpton, to Xerox Corporation. Methods of thermoplastic xerography and apparatus therefor. 3,698,892, Cl. 96-1.100.

Hewlett-Packard Company: *See—*
Chaney, Robert L., 3,699,383.
Kusters, John A., 3,698,792.

Heyl and Patterson, Inc.: *See—*
Rose, Bennie A., 3,698,648.

Hick, Harald Peter; and Pepelnik, Rudolf, to Osterreichische Studiengesellschaft fur Atomenergie Ges. m.b.H. Compton spectrometer having primary and secondary. 3,699,340, Cl. 250-83.3.
Hickey, Lionel R.; and Guyette, Frank L., to Eastman Kodak Company. Control apparatus for electrophotographic apparatus. 3,698,805, Cl. 355-14.000.
Higgins, David H.: *See—*
Miller, Robert L.; and Higgins, David H., 3,699,422.
Higham, Peter: *See—*
Leane, John Bryant; and Higham, Peter, 3,699,428.
Hill, Frank W.; Bartlett, Peter G.; and Clark, Larry K., to Bliss, E. W., Company. Apparatus for allocating and timing a plurality of load intervals. 3,699,512, Cl. 340-41.
Hill, Wayne E., to United States of America, Army. Embryo stripper. 3,698,458, Cl. 146-2.00r.
Hindle, Son and Company Limited: *See—*
Hindle, Thomas; and Banks, David Dugmore, 3,698,444.
Hindle, Thomas; and Banks, David Dugmore, to Hindle, Son and Company Limited. Pneumatic picking mechanisms. 3,698,444, Cl. 139-142.000.
Hingst, Gerd: *See—*
Kundler, Walter; and Hingst, Gerd, 3,699,420.
Hipsher, Gary L., to General Tire & Rubber Company, The. Dual rate fluid damped elastomeric bushing. 3,698,703, Cl. 267-63.000.
Hirahara, Katsuji. Freeze molding slice material. 3,698,201, Cl. 62-62.000.
Hirata, Miyoshi: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.
Hirsch, Stanley; and Schneider, Irving, to Structural Industries, Inc. Frame construction. 3,698,114, Cl. 40-155.000.
Hirschberg, Kenneth A., to United States of America, Army, mesne. Seismic system for real-time reporting. 3,699,509, Cl. 340-15.000.
Hirschhorn, Sidney H. Rope clamps. 3,698,042, Cl. 24-19.000.
Hitachi Limited: *See—*
Emoto, Masayuki; and Maki, Yoshiyuki, 3,698,956.
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Kondo, Toshio; and Tamura, Hifumi, 3,699,381.
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Hittle, Eugene C.: *See—*
Collins, Edward C.; and Hittle, Eugene C., 3,698,780.
Hlipala, Edward; and Schindel, Arnold, to Singer Company, The. Temperature compensated adjustable damper unit. 3,699,369, Cl. 310-106.000.
Hocherl, Gunther, to Carl Zeiss-Stiftung; a/b/a Carl Zeiss. Radiation sensitive device for the successive investigation of several samples. 3,699,348, Cl. 250-218.000.
Hodge, Frederick J., to Minnesota Mining and Manufacturing Company. Dropout compensator having a self-balancing switch. 3,699,246, Cl. 178-6.600.
Hodge, Thomas, Jr.; and Bradie, Peter R., said Hodge, Thomas, Jr. assor. to EPC & G, Inc., mesne. Display apparatus. 3,699,564, Cl. 340-317.000.
Hoeksema, Herman: *See—*
Bergy, Malcolm E.; Hoeksema, Herman; and Johnson, Le Roy E., 3,699,223.
Hoell, Paul C., to Du Pont de Nemours, E. I., and Company. Apparatus for copying magnetic tapes. 3,699,267, Cl. 179-100.20e.
Hoffman, Donald O., to American Optical Corporation. Method of treating lens polishing pads. 3,698,937, Cl. 117-113.000.
Hoffman, Robert N.; and Kern, Loyd R., to Atlantic Richfield Company. Drilling method and bit. 3,698,491, Cl. 175-329.000.
Hoffmann-La Roche Inc.: *See—*
Kiss, Joseph, 3,699,103.
Hogan, Bernard E., Jr. Tire retreading method. 3,698,975, Cl. 156-96.000.
Hohenberg, Reiner Mathias; and Knitter, Heinz, to Bunker-Ramo Corporation, The. Reciprocating switch assembly for distribution panels. 3,699,280, Cl. 200-16.00a.
Holdaway, Daniel O., to International Business Machines Corporation. Radiant energy mark sensor. 3,699,350, Cl. 250-225.000.
Holdsworth, John E.; and Weir, Dallas M., Jr., to Ingersoll-Rand Company. Automatic fluid supply and control means. 3,698,838, Cl. 417-228.000.
Holiday Luggage Mfg. Co., Inc.: *See—*
Aronoff, Arnold, 3,698,522.
Holl, Helmar H.: *See—*
Kleinschmidt, Johann O.; Walter, Heinz E.; and Holl, Helmar H., 3,698,334.
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A., to Air Products and Chemicals, Inc. Fluorinated cyclic alcohol and their esters. 3,699,156, Cl. 260-486.00h.
Holland, William P.; and Azud, Robert E., to Machlett Laboratories Incorporated, The. X-ray tube with electricallp conductive bearing bypass. 3,699,373, Cl. 313-60.000.
Holley Carburetor Company: *See—*
Eshelman, Philip V.; Erickson, Roy O.; and Marsh, Keith D., 3,698,372.
Hollingsworth, John W.: *See—*
Werlein, Eugene R.; Hollingsworth, John W.; and Pinson, Lyndon D., 3,699,231.
Hollins, Jesse R. Clamp for vehicle storage battery spring type cable terminal. 3,699,506, Cl. 339-237.000.
Holmes, Elizabeth E.: *See—*
Holmes, Raymo W.; and Holmes, Elizabeth E., 3,698,779.
Holmes, John E.: *See—*
Berning, Eugene B.; and Holmes, John E., 3,698,682.
Holmes, Raymo W.; and Holmes, Elizabeth E. Container. 3,698,779, Cl. 312-126.000.
Holsinger, William Perry, to United States of America, Health, Education and Welfare. Patient electrode isolation. 3,699,389, Cl. 317-9.00r.
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Hull, Charles W.; and McKinney, Charles R., to Bell & Howell Company. Magnetic mass spectrometer with shaped, uniformly saturating magnetic poles. 3,699,332, Cl. 250-41.9me.

Hull, Colin G., to Shell Oil Company. Aromatic polysulfites. 3,699,144, Cl. 260-456.00p.

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Huntsinger, Dean P., to Collins Radio Company. Analog harmonic rejecting phase detector. 3,699,461, Cl. 328-134.000.

Huo, Wendell Y. Slide rule with operational guidance and decimal point location means. 3,699,313, Cl. 235-64.300.

Hurlburt, Joseph C.; McCarty, Horace G.; and Locati, Norman C., to Sperry Rand Corporation and Omark Industries, Inc. Blade mount for belt mower. 3,698,167, Cl. 56-291.000.

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Ishibashi, Wataru; Nakano, Satoru; and Yokotani, Takeo, to Iwatani & Co., Ltd. Method and apparatus for incinerating waste oil. 3,698,362, Cl. 122-136.00r.

Ishigaki, Eiichi, to Ishigaki Kiko Co., Ltd. Clarifying filter press. 3,698,557, Cl. 210-225.000.
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Johnson, Edward J., Jr., to Polaroid Corporation. Diffusion transfer process utilizing 2-mercapto imidazoles. 3,698,900, Cl. 96-29.000.
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Kabushiki Kaisha Koparu: *See—*
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Maruyama, Shoji; Saito, Tadashi; Yoshida, Shigeaki; and Shimada, Masaru, 3,699,000.
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Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See—*
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Kade, James Henry: *See—*
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Kaempf, Gerhard P.: *See—*
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Kahabka, Richard D.: *See—*
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Kaiser Aluminum & Chemical Corporation: *See—*
Sanderford, Freeman M.; and Ray, Jack C., 3,699,041.

Kaiser, Donald W., to Ansul Company, The. 1-Alkyl-4-bis (haloalkyl) amino-3,5-dinitrobenzene. 3,699,167, Cl. 260-577.

Kaito, Takeo: *See—*
Yamamura, Yuichi; Fujii, Setsuro; Okano, Atsuji; Hirata, Miyoshi; Abiko, Yasushi; Inaoka, Masato; Noroi, Reimei; Iwamoto, Mashiro; Funabashi, Shoichi; and Kaito, Takeo, 3,699,149.

Kakalec, Robert John: *See—*
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Kalle Aktiengesellschaft, mesne: *See—*
Moschel, Albrecht; Luders, Walter; and Steppan, Hartmut, 3,699,086.

Kalousek, George L.; and Benton, Elton J., to United States of America, Interior. Saline resistant cementitious binders. 3,698,924, Cl. 106-89.000.

Kalsi, Manmohan Suigh: *See—*
Harrah, Robert S.; and Kalsi, Manmohan Suigh, 3,698,351.

Kalwaites, Frank, to Johnson & Johnson. Apparatus for spreading tows of continuous filaments into sheets. 3,698,039, Cl. 19-66.000.

KAMAG Transporttechnik GmbH, & Co.: *See—*
Weinmann, Karl, 3,698,582.

Kamins, Seymour; Rosenberg, Norman; and Bentsen, Per, to CTP Industries Inc. Apparatus for automatic manufacture of handle bags. 3,698,289, Cl. 93-8.000.

Kamo, Seiichi: *See—*
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Kanou, Kimio: *See—*
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Kantorowicz, Gerard, to Thomson-CSF. Delay lines. 3,699,379, Cl. 315-3.500.

Kasai, Keiji: *See—*
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Kasak, August; Thompson, Vernon R.; and Moll, John H., to Crucible Inc. Method for producing superalloy articles by hot isostatic pressing. 3,698,962, Cl. 148-11.50f.

Kaspaul, Alfred F.; and Kaspaul, Erika E., to Hughes Aircraft Company. Transparent conductive coating and process therefor. 3,698,946, Cl. 117-211.000.

Kaspaul, Erika E.: *See—*
Kaspaul, Alfred F.; and Kaspaul, Erika E., 3,698,946.

Kass, David. Spool and cover assembly. 3,698,546, Cl. 206-52.00w.

Katerndahl, Dean R.; Wilson, Earl D.; Macalalad, Fidel V.; and Ring, Gene C., to Abbott Laboratories. Catheter assembly for peritoneal cavity insertion. 3,698,396, Cl. 128-347.000.

Kato, Hiroki: *See—*
Iimura, Kazuo; Sawada, Kiyoshi; and Kato, Hiroki, 3,698,817.

Katsuragawa Denki Kabushiki Kaisha: *See—*
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Kauczor, Hans-Werner: *See—*
Roever, Wilhelm; Junghanss, Helmut; and Kauczor, Hans-Werner, 3,699,207.

Kauffman, Harry D.; and Davis, Malcolm F., to Cincinnati Milacron Inc. EDM process a method and apparatus for controlling the flow rate of dielectric as a function of gap impedance. 3,699,303, Cl. 219-69.00f.

Kaufmann, Harland A.: *See—*
Bossmann, Clifford W.; Kaufmann, Harland A.; and Mathes, Charles E., 3,698,069.

Kaugars, Girts, to Upjohn Company, The. Halogen substituted pyrininealdehyde phenyl hydrazones. 3,699,111, Cl. 260-296.00r.

Kaulins, Edward, to Timex Corporation. Contact assembly for electric watches. 3,698,179, Cl. 58-28.00r.

Kaup, Siegfried: *See—*
Ameling, Bernhard; and Kaup, Siegfried, 3,698,212.

Kautz, William H., to United States of America, Navy. Cellular arithmetic array. 3,699,534, Cl. 340-172.500.

Kaveckis, Joseph E.: *See—*
Tokarz, Richard D.; and Kaveckis, Joseph E., 3,699,200.

Kawai, Yoshihiro: *See—*
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Kawashima, Masao: *See—*
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Kayser, John P.: *See—*
Wasson, John H.; Sherry, John S.; and Kayser, John P., 3,699,235.

Keady, Frederick D., to Weatherhead Company, The. Brake warning switch with bypass. 3,698,771, Cl. 303-6.00c.

Keehn, George R.: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, 3,698,323.

Keesee, Ernest W. Edger for lawn mower. 3,698,165, Cl. 56-11.400.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Chemically curable liquid polyene-polythiol polymer composition. 3,699,084, Cl. 260-858.000.

Kelch, Heinz; and Schuh, Eduard, to Kienzle Apparate G.m.b.H. Taximeter arrangement with exchangeable control unit. 3,698,627, Cl. 235-30.00r.

Kelch, Heinz, to Kienzle Apparate G.m.b.H. Gravity feed with axially movable attaching means. 3,699,557, Cl. 340-174.10c.

Keller-Volper, Ernest. Insertable cylinder for a door lock. 3,698,216, Cl. 70-380.000.

Kelly, Gordon Emmet, to RCA Corporation. Apparatus for Hotchossis electronic instruments. 3,699,562, Cl. 340-253.00r.

Kelly, John C. Fan construction. 3,698,835, Cl. 416-132.000.

Kelly, John J. Variable indicia sign. 3,698,112, Cl. 40-96.000.

Kelly, Michael J. Photographic multi-tone separation process. 3,698,906, Cl. 96-44.000.

Kelpin, Thomas G. Aquatic harvester. 3,698,163, Cl. 56-9.000.

Kelsey Hayes Company, mesne: *See—*
Rozmus, Walter J., 3,698,438.

Kemeny, Julius: *See—*
Joseph, Raymond S.; and Kemeny, Julius, 3,699,580.

Kemlage, Bernard M.; and Pogge, Hans B., to International Business Machines Corporation. Process for forming monocrystalline and poly. 3,698,947, Cl. 117-212.000.

Kendrick, William P.: *See—*
Lubowitz, Hyman R.; Kendrick, William P.; Jones, John F.; and Burns, Eugene A., 3,699,074.

Kenrick, Joseph F. Catcher for fruits nuts, and the like. 3,698,170, Cl. 56-329.000.

Kent-Moore Corporation: *See—*
Deming, Roy, 3,698,244.

Kern, Loyd R.: *See—*
Hoffman, Robert N.; and Kern, Loyd R., 3,698,491.

Kersten, Samuel D., Jr.; Sautter, Alton F.; and Simon, John M., to Water Saver Faucet Co. Valve assembly. 3,698,421, Cl. 137-356.000.

Kerstetter, Donald R.: *See—*
Buescher, William E.; and Kerstetter, Donald R., 3,699,378.

Kesinger, Donald, to Gates Rubber Company, The. Plant cover and method. 3,698,131, Cl. 47-29.000.

Kesten, Martin; and O'Connor, Ralph Bruce, to Preston Engravers, Inc. Adjustable air eject die-cutting assembly. 3,698,271, Cl. 83-99.000.

Kesten, Martin; and O'Connor, Ralph Bruce, to Preston Engravers, Inc. Rotary air eject die-cutting assembly. 3,698,272, Cl. 83-99.000.

Ketchpel, Richard D.: *See—*
Curran, Robert E.; Robertson, Glenn D., Jr.; and Ketchpel, Richard D., 3,698,884.

Ketterer, Stanley J., to Singer Company, The. Rotating shuttle drive mechanisms. 3,698,333, Cl. 112-189.000.

Keunecke, Gerhard: *See—*
Brendt, Dieter; Helms, Gerd; and Keunecke, Gerhard, 3,699,008.

Kewanee Oil Company: *See—*
Vogt, John W.; and Schrier, Peter G., 3,698,392.

Keystone Micro-Scan, Inc., mesne: *See—*
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Kienzle Apparate G.m.b.H.: *See—*
Kelch, Heinz; and Schuh, Eduard, 3,698,627.

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Kietzer, James E.; and Mente, Joseph N., to United States of America, Navy. Channel combining circuit for synchronous phase detection systems. 3,699,462, Cl. 329-112.000.
Kikuchi, Tomio; Yamaguchi, Hiroshi; and Arai, Kiyoyuki, to Kabushiki Kaisha. Flash photographic device for automatic exposure control cameras. 3,698,298, Cl. 95-10.0ce.
Kilburg, Ronald J.: *See—*
Mayo, Cecil J.; and Kilburg, Ronald J., 3,699,275.
Kilby, Jack S.: *See—*
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Kimber, Anthony B.: *See—*
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Kimura, Hiroyuki: *See—*
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Kimura, Ichiro: *See—*
Nagata, Takeo; Takasaka, Masahiro; and Kimura, Ichiro, 3,698,414.
Kindell, Jerry L.; and Trubisky, Leonard G., to Honeywell Information Systems Inc. Rounding numbers expressed in 2's complement notation. 3,699,326, Cl. 235-175.000.
King, James F., to Clark Equipment Company. Bulldozer mounting and controls. 3,698,490, Cl. 172-803.
Kingsley, John T., to Motorola, Inc. Method of applying leads to an integrated circuit. 3,698,076, Cl. 29-471.100.
Kingston, George W.: *See—*
Diamond, Robert F.; and Kingston, George W., 3,698,329.
Kinnan, Frank R. Vibratory earth engaging shank. 3,698,484, Cl. 172-40.000.
Kinnebrew, John E. Air reconditioning apparatus. 3,698,158, Cl. 55-227.000.
Kinney, John F. Acceleration selector unit for automobile accelerators. 3,698,261, Cl. 74-562.000.
Kinnroth, Samuel F.: *See—*
Klein, Emil, 3,698,180.
Kinsel, Tracy Stewart, to Bell Telephone Laboratories, Incorporated. Frequency shift keyed communication system. 3,699,445, Cl. 325-30.000.
Kirchhoff, Horst-Guenter; Pfabe, Peter; and Sedlmayr, Gerhard. Inertia operated locking retractor. 3,698,657, Cl. 242-107.400.
Kirk, Merritt C., Jr.: *See—*
Mills, Ivor W.; Dimeler, Glenn R.; Kirk, Merritt C., Jr.; and Boyer, Jackson S., 3,699,071.
Kishi, Teruo: *See—*
Tanaka, Masao; Kishi, Teruo; and Mineura, Kazuyuki, 3,699,113.
Kiss, Joseph, to Hoffmann-La Roche Inc. Process for the manufacture of 5-desoxy-L-arabinose and novel intermediates. 3,699,103, Cl. 260-210.00r.
Kitamura, Masaru, to KTM Industries, Inc., mesne. Rotatory valve having one piece seat construction. 3,698,687, Cl. 251-315.000.
Kiyasu, Zen'Iti; Kawashima, Masao; Sasaki, Shunroku; Mineshima, Yukihiko; and Kurita, Shyoichi, to Fujitsu Limited. Analog code conversion system. 3,699,567, Cl. 340-347.0ad.
Klavins, Aldis, to Honeywell Information Systems, Inc. Use of control words to change configuration and operating made of a data communication system. 3,699,525, Cl. 340-172.500.
Klein, Emil, 20% to Kinnroth, Samuel F. Automatic chess time indicator. 3,698,180, Cl. 58-145.00d.
Klein, Richard Ira: *See—*
Sorkin, Howard; and Klein, Richard Ira, 3,698,449.
Klein, Stanley Frank, to Raytheon Company. Memory look ahead connection arrangement for writing into an unoccupied address and prevention of reading out from an empty address. 3,699,535, Cl. 340-172.500.
Kleinschmidt, Johann O.; Walter, Heinz E.; and Holl, Helmar H., to Singer Company, The, mesne. Position signaling devices for sewing machine driving unit. 3,698,334, Cl. 112-220.000.
Kling, Harry C.: *See—*
Ake, Nelson E.; and Kling, Harry C., 3,698,976.
Klingen, Theodore J.; and Wright, John R., to United States of America, Atomic Energy Commission. Radiation polymerization of vinyl carboranes an novel productions resulting therefrom. 3,699,024, Cl. 204-159.220.
Kluge, Werner Erich, to Northern Electric Company Limited. Adaptable associative memory system. 3,699,545, Cl. 340-173.0am.
Klutchko, Sylvester: *See—*
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Von Strandtmann, Maximilian; Klutchko, Sylvester; and Shavel, John, Jr., 3,699,129.
Kmecak, Ronald A.; and Kovach, Stephen M., to Ashland Oil, Inc. Alkyl transfer of alkyl aromatics with group VIB metals on mordenite. 3,699,181, Cl. 260-672.00t.
Knight, Leslie Hugh. Apparatus for grinding grain. 3,698,650, Cl. 241-51.
Knight, Tom H. Bunk for a truck cab sleeping berth. 3,698,022, Cl. 5-118.000.
Knitter, Heinz: *See—*
Hohenberg, Reiner Mathias; and Knitter, Heinz, 3,699,280.
Knoos, Stellan. Method and device for hot gas engine or gas refrigeration machine. 3,698,182, Cl. 60-24.000.
Knuth, William H.: *See—*
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Kobayashi, Makoto: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakazima, Jun, 3,698,652.
Kobler, Richard; and Fagan, William F., to McGraw-Edison Company. Endless loop tape recorder. 3,698,723, Cl. 274-4.00r.
Kobori, Toshio, to Minolta Camera Kabushiki Kaisha. Electric shutter mechanism for a camera. 3,698,300, Cl. 95-10.0ct.
Koch, Friedrich: *See—*
Zeug, Robert; and Koch, Friedrich, 3,698,694.
Kocian, James A.: *See—*
Plattner, Robert F.; and Kocian, James A., 3,698,310.
Kodaira, Yasuo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Switch flourish plate. 3,699,236, Cl. 174-66.000.
Kodama, Tsutomu: *See—*
Kodama, Yutaka; Kodama, Tsutomu; Nakabayashi, Masao; and Komatu, Shigekazu, 3,699,188.
Kodama, Yutaka; Kodama, Tsutomu; Nakabayashi, Masao; and Komatu, Shigekazu, to Toyama Chemical Co., Ltd. Fire resistant polymers. 3,699,188, Cl. 260-865.000.
Koeber, Henry J., to Bell & Howell Company. Power transmission mechanism. 3,698,253, Cl. 74-129.000.
Koeniger, Arthur F.: *See—*
Hechenbleikner, Ingenuin A.; Hussar, John F.; Koeniger, Arthur F.; and Bresser, Robert E., 3,699,152.
Koens, Jeffrey G.; and Merillat, Robert D., to International Business Machines Corporation. Validation technique for integrated circuit manufacture. 3,698,072, Cl. 29-574.000.
Koerner, Ernest C.; Trice, Robert T.; and Wareham, William W., to Phelps Dodge Magnet Wire Corporation. Method of processing preformed polyester resins and converting to coating materials. 3,699,082, Cl. 260-75.0nk.
Koester, Waldemar, to Friedrich Maurer Soehne, Firma. Expansion gap sealing device. 3,698,292, Cl. 94-18.000.
Kofink, Siegfried, to Eberspacher, J. Control for electro-magnetic pump. 3,699,354, Cl. 307-120.000.
Kohayakawa, Takashi; Yamamoto, Shinichi; and Morimoto, Michio, to Daihatsu Kogyo Co., Ltd. Rotary after burner for internal combustion engines. 3,698,873, Cl. 23-277.00c.
Kohn, Gustave K., to Chevron Research Company. N-Substituted acylamidosulfenyl chlorides and their method of preparation. 3,699,122, Cl. 260-326.50s.
Kohn, Gustave K., to Chevron Reseah Company. N-Substituted carbamoyl chlorides and method of preparation. 3,699,163, Cl. 260-544.00c.
Kohner Bros., Inc.: *See—*
Stubbmann, Albert, 3,698,252.
Kojima, Hideo: *See—*
Suzuki, Yoshitaka; Takenoue, Atsushi; and Kojima, Hideo, 3,699,178.
Kolbe, Hans, & Co., KG: *See—*
Lindenmeier, Heinz; and Meinke, Hans-Heinrich, 3,699,452.
Kolinsky, Miloslav, to Ceskoslovenska akademie ved. Distributing slide valve for laboratory purposes. 3,698,439, Cl. 137-625.480.
Kollmorgen Corporation: *See—*
Henry-Baudot, Jacques, 3,699,371.
Kollsman Instrument Corporation: *See—*
Cohen, Murray F.; and Tarasevich, Michael, 3,699,334.
Stempler, Samuel; and Tellerman, Jacob, 3,699,421.
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Kombinat Veb Pentacon Dresden Kamera- und Kinowerke: *See—*
Reimann, Hubertus; and Lindner, Fritz, 3,698,301.
Konazewski, William: *See—*
Taylor, Arthur Sinclair; Sandhage, Ellsworth; Bott, George; and Konazewski, William, 3,698,450.
Kondo, Toshio; and Tamura, Hifumi, to Hitachi, Ltd. Ion source device having control means for reducing filament current below its starting value. 3,699,381, Cl. 315-74.000.
Konishi, Kozo; Suzui, Masaaki; Otake, Michio; and Maeda, Tatuo, to Denki Kagaku Kogyo Kabushiki Kaisha. Paper coating pigment binder of alcoholized vinyl acetate-acrylamide copolymer. 3,699,112, Cl. 260-29.4ua.
Konishiroku Photo Industry Co., Ltd.: *See—*
Sakazume, Kaiichiro; Ito, Shigemasa; Sato, Shui; Sakamoto, Eiichi; and Oshima, Akio, 3,698,910.
Sato, Shui; Sugita, Sadao; Nakajima, Tomio; and Kasai, Keiji, 3,698,907.
Koons, Edwin Russell; Parker, Ralph G., Jr.; and Rupley, Jeffery P., to Mallory, P. R., & Co., Inc. Solderable stainless steel. 3,698,880, Cl. 29-195.000.
Koontz Machine & Welding, Inc.: *See—*
Beaver, Robert D., 3,698,690.
Koontz, Raymond A.; and Reese, Walter H. Protective cover structure. 3,698,409, Cl. 135-6.000.
Koppers Company, Inc.: *See—*

Fekete, Frank; Thrash, David J.; and Pulman, Leonard J., 3,698,981.
Williams, Charles H., 3,698,208.
Williams, Charles H., 3,698,436.
Kortschot, Cornelis; and Adams, Peter F., to Corporate Foods Limited. Method of preparing textured snack food product. 3,698,914, Cl. 99-83.000.
Koser, Robert F.: *See—*
Koser, Robert F.; and Messner, Jack D. (said Messner assor. to said), 3,698,575.
Koser, Robert F.; and Messner, Jack D., said Messner assor. to said Koser, Robert F. Automatically lowering unloader. 3,698,575, Cl. 214-17.0db.
Kostrzewski, James A.: *See—*
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Kotrappa, Payasada; and Light, Max E., to United States of America, Atomic Energy Commission. Centrifuge separator. 3,698,626, Cl. 233-2.000.
Kousaka, Masanobu: *See—*
Arima, Kei; Tamura, Gakuzo; Imanaka, Hiroshi; Kousaka, Masanobu; and Fukuda, Akio, 3,699,121.
Kovach, Stephen M.: *See—*
Kmecak, Ronald A.; and Kovach, Stephen M., 3,699,181.
Koyama, Mikihiro, to Honda Giken Kogyo Kabushiki Kaisha. Support of an air hose of an air cleaner of a motorcycle at its inlet opening. 3,698,503, Cl. 180-33.00r.
Koyano, Takashi; and Fukushi, Saburo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for preparing dialkoxyalkas. 3,699,174, Cl. 260-615.00r.
Krabetz, Richard: *See—*
Armbrust, Herbert; Sturm, Hans Juergen; Engelbach, Heinz; Wistuba, Hermann; Stoessel, Armin; and Krabetz, Richard, 3,699,134.
Krakow, Heinz; and Niedorf, Carl, to Blohm & Voss AG. Method and device for supplying a band made of sheet metal plates to a spiral welded tube mill. 3,698,622, Cl. 228-5.000.
Kraut, Edgar A.: *See—*
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Kravchenko, Zhorzh Yakovlevich: *See—*
Vlasov, Viktor Griogroievich; Berezentsev, Jury Sergeevich; Mukhin, Vladimir Vanovich; and Kravchenko, Zhorzh Yakovlevich, 3,699,572.
Kreider, Benjamin A.; Schmidt, Charles J.; and Martindell, Howard R., to Abar Corporation. Fixture for heat treating furnaces. 3,698,698, Cl. 263-47.00r.
Kreitner, Frederick J., to Sperry Rand Corporation. Active tank stabilizer for marine vessels. 3,698,345, Cl. 114-125.000.
Krober, Gunther: *See—*
Cranskens, Georg; Krober, Gunther; and Palm, Richard, 3,698,804.
Krombach, Thomas C. Mechanics over-the-engine accessibility carrier. 3,698,330, Cl. 108-44.000.
Kronish, Donald P.; and Zuriff, Lee S., to Warner-Lambert Company. Diagnostic preparation for the identification of β-hemolytic streptococci. 3,699,003, Cl. 195-105.50r.
Krueger, Friedrich; and Bauer, Lieselotte, to Benckiser, Joh. A., GmbH Chemische Fabrik. Process of preventing scale and deposit formation in aqueous systems and product. 3,699,048, Cl. 252-180.000.
Kruklitis, Karlis, to Burroughs Corporation. Electromagnetic read and write had test device and method using a minute body of magnetic recording material. 3,699,430, Cl. 324-34.00r.
Krummel, Harry Karl: *See—*
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Krumreich, Charles L.: *See—*
Hardesty, Edwin C.; Krumreich, Charles L.; Mulbarger, Albert E., Jr.; and Walen, Stephen W., 3,699,498.
Krusche, Alfred: *See—*
Forster, Franz; Krusche, Alfred; and Hantelmann, Gunter, 3,698,415.
Kruzewski, William Frank; and Siwko, Karol, to GTE Sylvania Incorporated. Automatic frequency control circuitry for a varactor tuner system. 3,699,455, Cl. 325-423.000.
KTM Industries, Inc., mesne: *See—*
Kitamura, Masaru, 3,698,687.
Kubo, Moritada; and Shinomiya, Yasuo, to Tokyo Shibaura Electric Co., Ltd. Control device for turbine generators. 3,698,829, Cl. 415-36.000.
Kuck, John H., to United States of America, Navy. Flux-driver circuit for phased array. 3,699,397, Cl. 317-123.000.
Kuder, Milton L.: *See—*
Greenough, Maurice Leighton; and Kuder, Milton L., 3,699,518.
Kuehl, Earl J.; and Kuehl, LaMay R. Purchase payment collection apparatus. 3,698,517, Cl. 186-1.00a.
Kuehl, LaMay R.: *See—*
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Kuhar, George A., to Goodyear Tire & Rubber Company, The. Method for making high temperature insulating compositions and said compositions. 3,699,023, Cl. 204-159.190.
Kuhlman Corporation: *See—*
Macemon, Herbert J., 3,699,490.
Kuhn, Byron D. Board type game. 3,698,718, Cl. 273-134.00b.
Kundler, Walter; and Hingst, Gerd. Automatic control system controlling the course of a ship. 3,699,420, Cl. 318-588.000.
Kunz, Ernst. Spinning ring for ring spinning and ring twisting frames. 3,698,176, Cl. 57-119.000.
Kurita, Shyoichi: *See—*
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Kursawe, Helga: *See—*
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Kushlefsky, Bernard G.: *See—*
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Kusters, John A., to Hewlett-Packard Company. Optically transparent acoustic wave transducer. 3,698,792, Cl. 350-149.000.
Kutz, Aaron, to Fluidic Controls Corporation. Fluid logic module assembly with built-in manifold. 3,698,432, Cl. 137-68.000.
Kutz, Hugo Joseph. Water faucets. 3,698,688, Cl. 251-335.000.
Kuypers, Hubert: *See—*
Matthieu, Paul; Leuchs, Ottmar; Glander, Fritz; Kuypers, Hubert; and Pelz, Diethart, 3,698,440.
Kuzmik, John J., to MacDermid Incorporated. Preparation of plastic substrates for electroless plating and solutions therefor. 3,698,919, Cl. 106-1.000.
Kweller, Esher R.: *See—*
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Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
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La Grouw, Coenraad Maria; and Gie, Ong Tjing, to U.S. Philips Corporation. Glass having a high coefficient of absorption for infrared radiation comprising ferrous oxide. 3,698,921, Cl. 106-54.000.
Labana, Santokh S.: *See—*
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Gaudin, Jean Joseph, 3,698,494.
Lace, Melvin A., to Motorola, Inc. Synchronous motor mounting system for speed control. 3,698,615, Cl. 226-194.000.
Lacey, Robert L., to Illinois Tool Works Inc. On-off clamp for I. V. systems. 3,698,681, Cl. 251-10.000.
Lamer, Gerald P.; and Thiele, Duane L., to Case, J. I., Company, mesne. Mobile crane with jib extension. 3,698,569, Cl. 212-144.000.
Landen, William James; and Lundquist, Gunnar F., to International Silver Company, The. Brush making apparatus. 3,698,770, Cl. 300-1.000.
Landmark, Kenneth L.; and Ashley, Allan J., to Amsted Industries Incorporated. Modular abrasive wheel assembly. 3,698,141, Cl. 51-372.000.
Landrum, Leon L.: *See—*
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Landry, B. Roger: *See—*
Martin, John E.; and Landry, B. Roger, 3,698,483.
Landry, Murphy J., to United States of America, Atomic Energy Commission. Multiple beam laser system. 3,699,474, Cl. 331-94.500.
Lane, L. B., to Lee, Raymond, Organization, Inc., The. Tail gate protector and load bar. 3,698,760, Cl. 296-50.000.
Lang, John M.; and Trautman, Robert D., to Boeing Company, The. Semi-automatic restraint mechanism. 3,698,679, Cl. 248-361.000.
Lang, Ronald A., to Waters Mfg. Co., Inc. Animal actuated drinking valve. 3,698,685, Cl. 251-303.000.
Lanphier, Edward H.: *See—*
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Larsen, Arthur Bertel, to Bell Telephone Laboratories, Incorporated. Color television system with automatic correction of chroma amplitudes. 3,699,241, Cl. 178-5.4ac.
Laskey, Norman V. Hatch covers and ventilating system. 3,698,347, Cl. 114-202.000.
Launer, Wilbur A., to Union Special Machine Company. Device for tacking down the free end of a thread chain. 3,698,336, Cl. 112-252.000.
LaValle, Thomas Alvin, to Western Electric Company, Incorporated. Apparatus for forming and testing electrical components. 3,698,061, Cl. 29-203.100.
LaValle, Thomas Alvin, to Western Electric Company, Incorporated. Apparatus for winding elongated material on electrical component. 3,698,062, Cl. 29-203.00d.
Laviron, Charles: *See—*
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Le Febvre, Clarence A., Jr., to United Aircraft Corporation. Universal joint employing a fluid bearing for a movable nozzle. 3,698,192, Cl. 60-232.000.

Leacock, Ronald: *See—*
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Leafer, Morris A.: *See—*
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Leaman, Frank H. Method and composition of platinum plating. 3,698,939, Cl. 117-130.000.

Leane, John Bryant; and Higham, Peter, to Perkin-Elmer Limited. Nuclear magnetic resonance spectrometer system. 3,699,428, Cl. 324-.50r.

Lear Siegler, Inc.: *See—*
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Leatherman, Hugh: *See—*
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Leatherman, Ralph W., 15% to Binham, Glenn, 15% to Mayhew, Ken, 30% to Ritchie, Henry and 15% to Leatherman, Hugh. Safety electrical receptacle. 3,699,285, Cl. 200-51.007.

Lecce, James G. Apparatus for feeding and maintaining neonatal piglets. 3,698,361, Cl. 119-51.110.

Leclercq, Richard L.: *See—*
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Lee, Ernest O., Jr., to Stromberg-Carlson Corporation. Scanner and translator-marker arrangement for PBX. 3,699,262, Cl. 179-18.0et.

Lee, John H., to Minnesota Mining and Manufacturing Company. Security system for indicating fire, intrusion or the like. 3,699,569, Cl. 340-409.000.

Lee, Joo C.; and Tak, Charles S. Ground fault detection system with sequential line testing. 3,699,392, Cl. 317-18.00r.

Lee, Raymond, Organization, Inc., The: *See—*
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Lee-Norse Company: *See—*
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Leed & Northrup Company: *See—*
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Leeks, Robert Ernest; and Demers, Alfred John, to Borden Company, The. Coated resilient matting and method for making. 3,698,933, Cl. 117-72.000.

Lefebvre, Jean: *See—*
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Leitgeb, Wilhelm, to Siemens Aktiengesellschaft. Electrodynamic linear motor. 3,699,365, Cl. 310-12.000.

Lejeune, Daniel, to Compagnie Generale des Etablissement Michelin, raison Sociale Michelin & Cie. Hydraulic balance. 3,698,492, Cl. 177-1.000.

Lemelson, Jerome H. Toy vehicles. 3,698,129, Cl. 46-202.000.

Lemelson, Jerome H. Tape cartridge and transducing means therefore. 3,699,266, Cl. 179-100.20z.

Lennartz, Gustav: *See—*
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Lentz, John J. Firing circuit for gas discharge tubes. 3,699,386, Cl. 315-356.000.

Lenzner, James. Method of sealing and insulating a roof construction. 3,698,972, Cl. 156-71.000.

Lerew, Wilford J.; and Peckels, Kenneth T. Portable holder. 3,698,675, Cl. 248-311.000.

Lestina, Gregory James; and Stern, Max Herman, to Eastman Kodak Company. Photographic dye image stabilizer-solvent. 3,698,909, Cl. 96-100.000.

Leuchs, Ottmar: *See—*
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Leutner, Volkmar, to Indramat, Gesellschaft fur Industrie-Rationalisierung und Automaticierung G.m.b.H. Balancing and adjusting arrangement for an extrusion mandrel. 3,698,846, Cl. 425-149.000.

Levine, Richard: *See—*
Amici, Francis Robert; Davis, Robert E.; and Levine, Richard, 3,698,134.

Levoin, Francis Jean Henri Raymond, to Carpano & Pons S.A. Fishing tackle. 3,698,119, Cl. 43-42.080.

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Lieberman, Abraham Buddy, to Glolok Co., Ltd. Automatic loading, arranging and dispensing device for articles and including containers, pouches and the like. 3,698,153, Cl. 53-61.000.

Lifschitz, Joshua, to Sperry Rand Corporation. Method of making printed circuit armature. 3,698,079, Cl. 29-598.000.

Lift Parts Mfg., Inc.: *See—*
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Light, Max E.: *See—*
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Lilly, Arnys Clifton, R.; and Tiller, Calvin O., to Morris, Philip, Incorporated. Oxygen-responsive electrical current supply. 3,698,955, Cl. 136-83.00r.

Lilly, Herbert J., Jr.: *See—*
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Lim, Teong C.: *See—*
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Lindenmann, Jean: *See—*
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Lindenmeier, Heinz; and Meinke, Hans-Heinrich, to Kolbe, Hans, & Co., KG. Active antenna arrangement for a plurality of frequency ranges. 3,699,452, Cl. 325-367.

Lindenmeyer, Michael Edward, to Bell Telephone Laboratories, Incorporated. Liquid armature switch. 3,699,485, Cl. 335-49.000.

Linders, John R. Polyphase signal monitoring system. 3,699,441, Cl. 324-86.000.

Lindner, Fritz: *See—*
Reimann, Hubertus; and Lindner, Fritz, 3,698,301.

Lindsey, James M., to Sperry Sun Well Surveying Company. Borehole data transmission system. 3,699,510, Cl. 340-18.ctm.

Lingnau, Josef, to Gestra-KSB Verlriebsgesellschaft mbH & Co. Thermal control element. 3,698,633, Cl. 236-99.000.

Linkel, John E.: *See—*
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Lins, Stanley J.; and Nelson, Charles J., to Sperry Rand Corporation. Method for sputter depositing dielectric materials. 3,699,034, Cl. 204-192.000.

Litchfield, Mason Rawleigh; and Scott, Floyd Logan, Jr., to Smith International, Inc., mesne. Mud saver valve and method. 3,698,426, Cl. 137-512.000.

Litman, Bernard; and Silvia, Everett R., to Ambac Industries, Inc. Center thrust retainer for spherical race ball bearing. 3,698,776, Cl. 308-35.000.

Little, Eric Cooper: *See—*
Stacey, Frank Donald; Rynn, John Munro William; and Little, Eric Cooper, 3,698,094.

Little, John W.; and Cebula, Thaddeus J., to Sears, Roebuck and Co. Combination jacket and hood. 3,698,014, Cl. 2-84.000.

Littlechild, James: *See—*
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Litvinoff, James R.; and Evans, David F., to American Hospital Supply Corporation. Counterbalancing tabletop construction. 3,698,327, Cl. 108-2.000.

Livingston, William L., to Factory Mutual Research Corporation. Method and apparatus for fighting fire. 3,698,481, Cl. 169-16.000.

Livingston, William L., to Factory Mutual Research Corporation. Fire protection system utilizing high-capacity direct discharge nozzles. 3,698,482, Cl. 169-16.000.

Lloyd, George Howard, to Marconi Instruments Limited. Peak detection circuits. 3,699,357, Cl. 307-235.00a.

Lloyd, Norman C.: *See—*
Chandra, Grish; Owen, William J.; Lloyd, Norman C.; and Cooper, Bryan E., 3,699,140.

Locati, Norman C.: *See—*
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Lockard, Joseph L.; and Rose, William Henry, to AMP Incorporated. Rotary switch with improved printed circuit contact and terminal connection array. 3,699,279, Cl. 200-11.00g.

Lockett, Eugene C. Mop. 3,698,030, Cl. 15-104.940.

Lockheed Aircraft Corporation: *See—*
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Rostad, Nels C., 3,698,662.

Loctite (Ireland), Limited: *See—*
O'Sullivan, Denis J.; and Bolger, Bernard J., 3,699,127.

Logan, Henry H. Actuator. 3,698,187, Cl. 60-52.07s.

Lohmann, Ernst, to Berkel G.m.b.H. Spring balance with vertical linearizing means. 3,698,496, Cl. 177-230.000.

Lonardo, Vincent P. Air pressure and vacuum gun. 3,698,641, Cl. 239-434.000.

Loncaric, Rado G., to Atlantic Richfield Company. Crack arrester. 3,698,746, Cl. 285-286.000.

Long Manufacturing Co., Inc.: *See—*
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Looker, Robert, to Satco Inc. Pallet for moving and securing cargo. 3,698,677, Cl. 248-346.000.

Lopes, Louis A., Jr., to United States of America, Navy. Strapped-down attitude reference system. 3,699,316, Cl. 235-150.250.

Loprest, Frank: *See—*
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Lord Corporation: *See—*
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L'Oreal: *See—*
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Lorio, Angelo. Sponge having a reservoir for cleaning liquid. 3,698,824, Cl. 401-205.000.

Losey, Jerry E., to Cincinnati Milacron Inc. EDM cap sensing. 3,699,301, Cl. 219-69.00c.

Louat, Lucien: *See—*
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Louks, Robert A. Process and apparatus for spreading granular material. 3,698,574, Cl. 214-17.0cb.

Lowe, Walter Max; and Squirrell, Frederick, to Thermo-Technical Development Limited. Gas tight isolators and valves. 3,698,429, Cl. 137-601.000.

LTV Aerospace Corporation: *See—*
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Lubowitz, Hyman R.; Kendrick, William P.; Jones, John F.; and Burns, Eugene A., to TRW Inc. Polyimide prepolymer molding powders. 3,699,074, Cl. 260-37.00n.

Lubowitz, Hyman R., to TRW Inc. Soluble high molecular weight polyimide. 3,699,075, Cl. 260-49.000.

Lucas, Raymond L. R. Sheet stacker and control stack removing means. 3,698,707, Cl. 271-68.000.

Lucien, Victor Gewiss, to Wood, Marc, Societe Anonyme pour la Promotion des Exchanges Techniques Internationaux. Chevron shaped article and a sandwich structure therefrom. 3,698,879, Cl. 29-191.000.

Lucker, Willi: *See—*
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Luders, Walter: *See—*
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Ludwig, Bernard J.; Berger, Frank M.; and Fukui, George M., to Carter-Wallace, Inc. Penicillin compounds. 3,699,097, Cl. 260-239.100.

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Luft, Robert G., to International Harvester Company. Supporting, leveling and height adjustment means. 3,698,759, Cl. 296-35.00r.

Lum, Kin Kwong: *See—*
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Lummus Company, The: *See—*
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Lund, Clifford C. Combination hitch bumper and spare tire carrier. 3,698,609, Cl. 224-42.050.

Lundquist, Gunnar F.: *See—*
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Lutchansky, Milton, to Bell Telephone Laboratories, Incorporated. Laser guidance system. 3,698,816, Cl. 356-152.000.

Lynes, Dennis Joseph; and Mar, Jerry, to Bell Telephone Laboratories, Incorporated. Two-terminal transistor memory utilizing collector-base avalanche breakdown. 3,699,540, Cl. 235-173.00r.

Lynes, Dennis Joseph; and Mar, Jerry, to Bell Telephone Laboratories, Incorporated. Two-terminal transistor memory utilizing emitter-base avalanche breakdown. 3,699,541, Cl. 340-173.00r.

Lynes, Dennis Joseph; and Mar, Jerry, to Bell Telephone Laboratories, Incorporated. Two-terminal transistor memory utilizing saturation operation. 3,699,542, Cl. 340-173.00r.

Lynn, Robert Reed: *See—*
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M & T Chemicals, Inc.: *See—*
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Maag, Gustav A.; and Gerth, Donald L., to Procter & Gamble Company, The. Method and apparatus for treating granular material. 3,698,097, Cl. 34-9.000.

Mac Duff, Richard, to Hercules Incorporated. Continuous blow molding process with reduction of length compensation. 3,699,199, Cl. 264-99.000.

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MacDonald, Eric; and Campbell, Frederick, to Ilford Limited. Photographic materials comprising formazan dyes. 3,698,908, Cl. 96-84.00r.

MacDonald, Hugh D.; and Doebley, Eugene J., to United States of America, Army. Initiator booster. 3,698,183, Cl. 60-26.100.

MacDonnell, Robert W., to Unity Railway Supply Co., Inc. Shipping cover for AB type control valve. 3,698,545, Cl. 206-46.00h.

Macemon, Herbert J., to Kuhlman Corporation. Fuse holder. 3,699,490, Cl. 337-202.000.

Machlett Laboratories Incorporated, The: *See—*
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Mack, Frank Joseph; and Simpkins, Terry John, to Drackett Company, The. Automatic toilet bowl cleaner dispenser. 3,698,021, Cl. 4-227.000.

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Madrazo, Charles Felix; Fulcher, Edwin Maxwell; and McDonagh, Kevin Patrick, to RCA Corporation. Gate circuit. 3,699,355, Cl. 307-215.000.

Maeda, Kazuo, to Mitsui Shipbuilding and Engineering Co., Ltd. Ships building method. 3,698,344, Cl. 114-77.00r.

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Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, to Glanzstoff A.G. Process for the production of thiophosgene. 3,699,161, Cl. 260-543.00r.

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Mail, Isaac Paul. Method for backwashing filters. 3,698,554, Cl. 210-80.

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Malkin, Emanuel, to Mass Feeding Corporation. Oven control. 3,699,307, Cl. 219-492.000.

Mallet, Emile, to Expandet S.A. Expansion fastener. 3,698,279, Cl. 85-71.000.

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Manjikian, Serop, to United States of America, Interior, mesne. Reverse osmosis module suitable for food processing. 3,698,559, Cl. 210-321.000.

Mann, Fred A., Jr. Apparatus for treating dust mops, dust cloths, and rugs. 3,698,213, Cl. 68-205.00r.

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Lynes, Dennis Joseph; and Mar, Jerry, 3,699,541.
Lynes, Dennis Joseph; and Mar, Jerry, 3,699,542.

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Martin, Gregory L.; and Blair, Lloyd R. Precision generation of linear F.M. signal. 3,699,448, Cl. 325-131.000.
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Martin, John E.; and Landry, B. Roger, to Temptat Corporation. Automatically resettable fire sprinkler valve. 3,698,483, Cl. 159-37.000.
Martin, Joseph F.: *See—*
Bryzinski, Thaddeus F.; and Martin, Joseph F., 3,699,549.
Martin, Robert J., to Cessna Aircraft Company, The. Axial piston device. 3,698,287, Cl. 91-507.000.
Martindell, Howard R.: *See—*
Kreider, Benjamin A.; Schmidt, Charles J.; and Martindell, Howard R., 3,698,698.
Maruyama, Shoji; Saito, Tadashi; Yoshida, Shigeaki; and Shimada, Masaru, to Kabushiki Kaisha Ricoh. Diazotype photoprinting material. 3,699,000, Cl. 96-91.
Mashima, Fumio, to Sanyo Electric Co., Ltd. Multifunctional video tape recorder of helical scan type. 3,699,247, Cl. 178-6.6fs.
Mass Feeding Corporation: *See—*
Malkin, Emanuel, 3,699,307.
Massa Division Dynamics Corporation: *See—*
Massa, Frank, 3,699,507.
Massa, Frank, 3,699,508.
Massa, Frank, to Massa Division Dynamics Corporation. Baffle structure for underwater transducer array. 3,699,507, Cl. 340-8.00s.
Massa, Frank, to Massa Division Dynamics Corporation. Means for increasing the acoustic power output of underwater transducers. 3,699,508, Cl. 340-8.000.
Masucci, Alan A. Spectacles with adjustable lenses. 3,698,801, Cl. 351-55.000.
Masuda, Takao: *See—*
Ohkubo, Kinji; Noguchi, Junpei; and Masuda, Takao, 3,699,114.
Masuyama, Takeshi: *See—*
Matsuoka, Michio; Masuyama, Takeshi; and Iida, Yoshio, 3,699,058.
Mathes, Charles E.: *See—*
Bossmann, Clifford W.; Kaufmann, Harland A.; and Mathes, Charles E., 3,698,069.
Matsuda, Ken: *See—*
Fine, Leonard Wolfe; Matsuda, Ken; and Photis, James Mitchell, 3,699,164.
Matsuoka, Michio; Masuyama, Takeshi; and Iida, Yoshio, to Matsushita Electric Industrial Co., Ltd. Uranium-modified zinc oxide voltage variable resistor. 3,699,058, Cl. 252-518.000.
Matsura, Thomas T., to American Optical Corporation. Ophthalmoscopes. 3,698,099, Cl. 351-6.000.
Matsushita Electric Industrial Co.: *See—*
Yukami, Noboru, 3,699,405.
Matsushita Electric Industrial Co., Ltd.: *See—*
Matsuoka, Michio; Masuyama, Takeshi; and Iida, Yoshio, 3,699,058.
Oka, Shunzo; and Miyashita, Akitoshi, 3,699,493.
Sasabe, Kaoru; and Oda, Fujio, 3,699,418.
Matsushita Electronics Corporation: *See—*
Yokozawa, Masami; and Iwasa, Hitoo, 3,698,945.
Mattel, Inc.: *See—*
Hartling, Donald C.; Joseph, Hawthorne; and Radin, William, 3,698,125.
Matthews, Harry P., to Goodrich, B. F., Company, The. Method of making and inspecting pneumatic tires having X-ray opaque cords. 3,698,971, Cl. 156-64.000.
Matthews, Jamie F., Jr., to Esso Production Research company. Method and apparatus for installation of a flow line riser on an offshore structure. 3,698,199, Cl. 61-72.100.
Matthias, Marx: *See—*
Diebold, Adolf; and Matthias, Marx, 3,698,929.
Matthieu, Paul; Leuchs, Ottmar; Glander, Fritz; Kuypers, Hubert; and Pelz, Diethart, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Thermally insulated conduit. 3,698,440, Cl. 138-149.000.
Maus, Otfrid; Mueller, Martin; and Mueller, Robert, to Schenck, Carl, Maschinenfabrik GmbH. Apparatus for controlling a balancing machine. 3,698,828, Cl. 408-11.000.
Maxwell, John: *See—*
Newman, Paul; and Maxwell, John, 3,698,145.
Mayer, Oscar, & Co., Inc.: *See—*
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 3,698,979.
Mayhew, John T. Method of cooling hot dipped galvanized continuously moving workpieces. 3,698,938, Cl. 117-114.00a.
Mayhew, Ken: *See—*
Leatherman, Ralph W., 3,699,285.
Maylandt, Helmut; Forster, Herbert; and Juhasz, Josef, to Bosch, Robert, G.m.b.H. Self-healing electrical condenser. 3,699,410, Cl. 317-258.000.
Mayo, Cecil J.; and Kilburg, Ronald J., to Insul-8-Corp. Composite electrical conductor. 3,699,275, Cl. 191-29.000.
MB Associates: *See—*
Cochran, David L.; Deleray, Arthur L.; and Lehman, John P., 3,698,320.
Mc Cann, Joseph A.; and Harnden, John D., Jr., to General Electric Company. Hybrid circuit power module. 3,699,402, Cl. 317-235.00r.
Mc Collum, John D.: *See—*
Connolly, John F.; Flannery, Robert J.; and Mc Collum, John D., 3,699,020.
Mc Cullough, Edward E., to Thiokol Chemical Corporation. Thrust vector control system. 3,698,642, Cl. 239-265.230.
McCallum, Donald A., to International Harvester Company. Positive pressure feed wheel. 3,698,332, Cl. 111-77.000.
McCarty, Horace G.: *See—*
Hurlburt, Joseph C.; McCarty, Horace G.; and Locati, Norman C., 3,698,167.
McClure, Glenn T., to Westinghouse Air Brake Company. Tread brake apparatus. 3,698,520, Cl. 188-171.000.
McCord Corporation: *See—*
Melnyk, William, 3,698,207.
McCoy, Wyn Eugene, to Timken Company, The. Tapered roller bearing with minimum heat generating characteristics. 3,698,777, Cl. 308-187.000.
McCulloch Corporation: *See—*
Frederickson, Robert Eugene; Zimmerer, John Louis; and Bailey, Jay Richard, 3,698,455.
McCullough, Floyd W. Spray device for irrigation purposes. 3,698,637, Cl. 239-68.000.
McDaniel, Carlos B.: *See—*
Midulla, Guiseppe, 3,699,046.
McDermott & Green, Inc.: *See—*
Green, Lawrence E.; and McDermott, William G., 3,698,132.
McDermott, William G.: *See—*
Green, Lawrence E.; and McDermott, William G., 3,698,132.
McDonagh, Kevin Patrick: *See—*
Madrazo, Charles Felix; Fulcher, Edwin Maxwell; and McDonagh, Kevin Patrick, 3,699,355.
McDonnell Douglas Corporation: *See—*
Jones, Harvey W.; and Ryer, Dudley A., Jr., 3,698,742.
Schenbeck, Robert E., 3,698,665.
Walker, James V., 3,698,728.
McDonough, Rort M.: *See—*
Berenbaum, Arthur; and McDonough, Rort M., 3,699,453.
McDonough, Thomas B.: *See—*
Shaffer, John W.; and McDonough, Thomas B., 3,699,021.
McGinnis, Patrick F., to Bendix Corporation, The. Mass filter electrode. 3,699,330, Cl. 250-41.9ds.
McGourty, Thomas K., to Kabushiki Kaisha Ricoh, mesne. Mechanical calculating apparatus for adding, subtracting, multiplying and dividing. 3,698,629, Cl. 235-63.00g.
McGraw-Edison Company: *See—*
Kobler, Richard; and Fagan, William F., 3,698,723.
McGuire, Marcus W.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.
McKechnie, John C., to United States of America, Navy. Automatic area of interest television optical probe focus apparatus. 3,699,248, Cl. 178-6.800.
McKechnie, John C., to United States of America, Navy. Automatic optical probe focus apparatus. 3,699,251, Cl. 178-7.200.
McKeeman, William M.: *See—*
Carlson, Carl B.; McKeeman, William M.; and Price, William C., 3,699,528.
McKell, Lynn J., to Bell Telephone Laboratories, Incorporated. Signal generator. 3,699,477, Cl. 331-142.000.
McKeown, Cornelius J.: *See—*

Rohr, Alton J.; and McKeown, Cornelius J., 3,698,331.

McKinney, Charles R.: *See—*
Hull, Charles W.; and McKinney, Charles R., 3,699,332.

McLean, William E., to General Motors Corporation. Flexible cable memory assembly. 3,699,546, Cl. 340-174.00m.

McLeod, William J.: *See—*
Smith, Calvin S.; and McLeod, William J., 3,699,218.

McNabb, George C., to Foxboro Company, The. Fluid oscillator flowmeter. 3,698,245, Cl. 73-194.00b.

McNamee, James P.: *See—*
Hess, Ralph A.; and McNamee, James P., 3,698,053.

McQuade, John E., Jr., to Esso Research and Engineering Company. Registered embossed high pressure laminates. 3,698,978, Cl. 156-219.000.

McQuistion, William E.: *See—*
Gilligan, William H.; and McQuistion, William E., 3,699,168.

Means, Lamoine E., to P. M. Products, Inc. Lock for sliding door or window. 3,698,754, Cl. 292-262.000.

Mecklenberg, Paul, to Bell Telephone Laboratories, Incorporated. Forward-acting error control system. 3,699,516, Cl. 340-146.1aq.

Mee, John D.: *See—*
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,699,025.
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,699,026.

Megatech Corporation: *See—*
Haldeman, Charles W.; and Basmajian, Vahan V., 3,698,370.

Meinke, Hans-Heinrich: *See—*
Lindenmeier, Heinz; and Meinke, Hans-Heinrich, 3,699,452.

Meisels, Alex; and Schott, Emilio, to Ciba-Geigy Corporation. 2,2'-Azines of 2,4-thiazolidinediones. 3,699,116, Cl. 260-306.7.

Melia, Thomas J., to United States Steel Corporation. Buoyant electric cable. 3,699,237, Cl. 174-101.500.

Melnyk, William, to McCord Corporation. Accumulator. 3,698,207, Cl. 62-503.000.

Melton, Thomas M., to Mobil Oil Corporation. Process for preparation of dialkyl vinyl phosphates. 3,699,193, Cl. 260-969.000.

Mente, Joseph N.: *See—*
Kietzer, James E.; and Mente, Joseph N., 3,699,462.

Mercer, Austin Cartwright, Jr., to Mercer Pneumatic Tools Limited. Machine tools, particularly a device for bar feed mechanism and a bar feed mechanism. 3,698,269, Cl. 82-38.00r.

Mercer Pneumatic Tools Limited: *See—*
Mercer, Austin Cartwright, Jr., 3,698,269.

Merck & Co., Inc.: *See—*
Putter, Irving, 3,699,158.

Meriano, Albert P.; Fuller, Giles A.; and Knuth, William H., to Aerojet-General Corporation. Direction and braking control for fluid cushion vehicles. 3,698,507, Cl. 180-119.000.

Merillat, Robert D.: *See—*
Koens, Jeffrey G.; and Merillat, Robert D., 3,698,072.

Merrick, Woodrow W.: *See—*
Norris, Clarence G.; and Merrick, Woodrow W., 3,698,068.

Merrill, Alvin S.; and Rosenhan, Bill J., to Moroni Corporation. Open gun sights for small arms. 3,698,091, Cl. 33-233.000.

Mersereau, Mark; Rohdenizer, Harold L.; Grunwald, John J.; and Innes, William P., to MacDermid Incorporated. Method of making additive printed circuit boards and product thereof. 3,698,940, Cl. 117-212.000.

Messick, Mikel Jay, to Square D Company. Firing angle advance limit for thyristor bridge power amplifier. 3,699,417, Cl. 318-257.000.

Messina, Giuseppe; Montorsi, Giorgio; and Caprara, Giuseppe, to Montecatini Edison S.p.A. Process for the preparation of olefin oxides. 3,699,133, Cl. 260-348.50v.

Messner, Jack D.: *See—*
Koser, Robert F.; and Messner, Jack D., 3,698,575.

Metallgesellschaft Aktiengesellschaft: *See—*
Grimm, Peter, 3,698,844.

Metropolitan Life Insurance Co.: *See—*
Dick, George W.; and Diamond, Norman, 3,698,630.

Metzger, William J., to Midland-Ross Corporation. Car coupler. 3,698,570, Cl. 213-146.000.

Meunier, Joseph R. J.; and Wieg, Heinrich J., to Bendix Corporation, The. Precision position indicator. 3,699,560, Cl. 340-239.00r.

Meyer, Gerhard: *See—*
Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, 3,699,161.

Meyer, Martin H.: *See—*
Scarnato, Thomas J.; and Meyer, Martin H., 3,698,162.

Meyer, Urs: *See—*
Gubler, Kurt; Meyer, Urs; and Brechbuhler, Hans Ulrich, 3,699,225.

Michigan State University, Board of Trustees of: *See—*
Hansen, Clarence M., 3,698,730.

Microwave Associates, Inc.: *See—*
Mueller, Martin, 3,699,480.

Middleditch, Alan E., to Westinghouse Electric Corporation. Sampled data numerical contouring machine controller apparatus and method providable with on line capability for contour cornering deceleration and acceleration. 3,699,317, Cl. 235-151.110.

Midgley, Edward L., to Standard Kollman Industries, Inc. Solid state tuner ntrol. 3,699,456, Cl. 325-455.000.

Midland Glass Company, Inc.: *See—*
Terner, E. M., 3,698,586.

Midland Ross Corporation: *See—*
Barr, Robert Alan, 3,698,541.

Midland Silicones Limited: *See—*
Chandra, Grish; Owen, William J.; Lloyd, Norman C.; and Cooper, Bryan E., 3,699,140.

Midland-Ross Corporation: *See—*
Metzger, William J., 3,698,570.

Midori-Kai Co., Ltd, The, mesne: *See—*
Watanuki, Toshio, 3,698,803.

Midulla, Guiseppe, 2% each to Rose, Howard L., Moon, Elmer, Early, Roger, 24 1/2% to Rubelsky, William C., 22 1/2% to Leacock, Ronald, 2% to Rubelsky, William P., 2% to Perez, Frank, Jr., 1% to Gibbons, Arthur S. and 2% to McDaniel, Carlos B. Motion pictur system. 3,699,046, Cl. 352-68.000.

Mifflin, Ralph W.: *See—*
Hanson, Donald W.; and Mifflin, Ralph W., 3,699,570.

Mihojevich, Steven; Zerfans, Arthur S.; Ostensen, Ralph G.; Berggren, Albin F., Jr.; and Glaser, Ronald A., to SCM Corporation. Electrostatic printer. 3,698,706, Cl. 271-9.000.

Mikan, Donald G.: *See—*
Du Bois, Robert Clark; Mikan, Donald G.; and Miller, Wayne H., 3,698,356.

Mikhailov, Nikolai Petrovich; Rapoport, Lev Moiseevich; and Taits, Samuil Zalmanovich, to Institut organicheskoi klimii im. N.D. Zelinskogo AN SSSR. Ebulliometer. 3,698,235, Cl. 73-17.00a.

Milchem Incorporated: *See—*
Browning, William C.; and Chesser, Billy G., 3,699,042.

Miles, John Walter: *See—*
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griefiths, Graham Ernest, 3,698,562.

Miles Laboratories, Inc.: *See—*
Ward, Frederick Edmund, 3,699,106.

Miller, Benny Jay: *See—*
Coulon, Edward I.; Miller, Benny Jay; and Mohr, Dale C., 3,698,274.

Miller, Christian F., to V.C.A. Corporation. Tamperproof closure device. 3,698,584, Cl. 215-9.000.

Miller, Darrow L., to North American Rockwell Corporation. Method of making an acoustical transducer. 3,698,051, Cl. 29-25.350.

Miller, Donald, to United States of America, Army. Projectile housing. 3,698,322, Cl. 102-56.000.

Miller, Donald, to United States of America, Army. Tape wrapping arrangement. 3,698,651, Cl. 242-7.230.

Miller, Donald F.: *See—*
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., 3,699,501.

Miller, Emery P., to Ransburg Electro-Coating Corporation. Deposition method. 3,699,027, Cl. 204-164.000.

Miller, Jarrell Denver; and Whiteside, Jimmy Talmage, to Huyck Corporation. Take-up mechanisms. 3,698,446, Cl. 139-308.000.

Miller, John Bellis, III: *See—*
Wing, Wilson Gordon; and Miller, John Bellis, III, 3,698,747.

Miller, Justin G.; deceased (by Miller, Rita Ann; administratrix), to Lear Siegler, Inc. Method and apparatus for controlling the flight path angle of aircraft. 3,698,669, Cl. 244-77.00a.

Miller, Michael Evans, to RCA Corporation. Phonograph pickup with self formed female receptacles. 3,699,268, Cl. 179-100.41k.

Miller, R. A., Industries, Inc.: *See—*
Miller, Robert A., 3,699,579.

Miller, Rita Ann: *See—*
Miller, Justin G., 3,698,669.

Miller, Robert A., to Miller, R. A., Industries, Inc. Aircraft antenna with wound wire radiating surface. 3,699,579, Cl. 343-702.000.

Miller, Robert L.; and Higgins, David H., to Honeywell Inc. Automatic battery charger. 3,699,422, Cl. 320-32.000.

Miller, Warner G. S. Automatic control system for forming fluted cutting tools. 3,699,411, Cl. 318-39.000.

Miller, Wayne H.: *See—*
Du Bois, Robert Clark; Mikan, Donald G.; and Miller, Wayne H., 3,698,356.

Millipore Corporation: *See—*
Danti, Bernard R.; and Brefka, Paul E., 3,699,291.

Mills, Ivor W.; Dimeler, Glenn R.; Kirk, Merritt C., Jr.; and Boyer, Jackson S., to Sun Oil Company. High modulus composition comprising hydrocarbon oil, rubber and carbon black. 3,699,071, Cl. 260-33.6aq.

Milwaukee Facicets, Inc.: *See—*
Schmitt, William C., 3,698,418.

Mine, Seizo: *See—*
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Mineshima, Yukihiko: *See—*
Kiyasu, Zen'Iti; Kawashima, Masao; Sasaki, Shunroku; Mineshima, Yukihiko; and Kurita, Shyoichi, 3,699,567.

Mineura, Kazuyuki: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., 3,699,501.
Hodge, Frederick J., 3,699,246.
Lee, John H., 3,699,569.

Minnite, Ralph. Article elevating device. 3,698,553, Cl. 209-173.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kobori, Toshio, 3,698,300.
Tenkumo, Shohei, 3,698,304.

Missimer, Dale J., to Gulf & Western Industries, Inc. Control system for low temperature refrigeration system. 3,698,202, Cl. 62-114.000.

Mitchell, Olga Mary Mracek: *See—*
Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, 3,699,271.

Mitsubishi Chemical Industries Limited: *See—*
Hamamoto, Masao; Kamo, Seiichi; and Nakayama, Kiyoshi, 3,698,885.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha, mesne: *See—*
Nagasawa, Shigeo, 3,698,373.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Sagara, Hideo, 3,698,223.
Shigematsu, Hiroji; Yamaguchi, Tomio; Fukue, Hisanobu; Ogawa, Hiroshi; Hashimoto, Takashi; Murakoshi, Kenichi; Suguri, Susumu; and Fujimura, Tsutomu, 3,699,436.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Maeda, Kazuo, 3,698,344.

Mitsuyama, Masaru; and Morita, Shigeru, to Toyo Kogyo Co., Ltd. Surging prevention device for use in vehicle having multicylinder spark-ignition internal combustion engine. 3,698,371, Cl. 123-198.00f.

Miyai, Masaya, to Aisin Seiki Kabushiki Kaisha. Tandem master cylinder. 3,698,190, Cl. 60-54.60e.

Miyamoto, Yoshikazu: *See—*
Shinohara, Takeo; and Miyamoto, Yoshikazu, 3,699,295.

Miyashita, Akitoshi: *See—*
Oka, Shunzo; and Miyashita, Akitoshi, 3,699,493.

Miyata, Akira; Tomita, Chikayoshi; Suzuki, Akio; Okubo, Hideyo; and Nagakumi, Masahiko, to Nippon Kokan Kabushiki Kaisha. Process for the electrolytic formation of aluminum coatings on metallic surfaces in molten salt bath. 3,699,012, Cl. 204-29.

Miyato, Akira; Ohkubo, Hideyo; Tomita, Chikayoshi; and Suzuki, Akio, to Nippon Kokan Kabushiki Kaisha. Method of electroplating readily oxidizable metals. 3,699,013, Cl. 204-32.00r.

Mobil Oil Corporation: *See—*
Allen, Paul T.; and Drinkard, B. M., 3,698,157.
Cattanach, John, 3,699,182.
Melton, Thomas M., 3,699,193.
Robinson, Allan B., 3,698,155.
Rubin, Mae K.; and Rosinski, Edward J., 3,699,139.

Mobley, Frederick F., to United States of America, Navy. Variable magnetic hysteresis rod system. 3,698,660, Cl. 244-1.00r.

Moeser, Alan J., to Columbia Broadcasting System, Inc. Amusement device producing sound with visual reinforcement. 3,698,128, Cl. 46-175.000.

Mohr, Bernhard; Engel, Heinz; and Heijnis, James Watt Ijsbrand, to Akzona Incorporated. Godet for yarn transport and stretching apparatus. 3,698,614, Cl. 226-193.000.

Mohr, Dale C.: *See—*
Coulon, Edward I.; Miller, Benny Jay; and Mohr, Dale C., 3,698,274.

Moll, John H.: *See—*
Kasak, August; Thompson, Vernon R.; and Moll, John H., 3,698,962.

Moltzan, Herbert J., to Texas Instruments, Incorporated. Production of very high purity metal oxide articles. 3,698,936, Cl. 117-105.200.

Monocraft, Inc.: *See—*
Chernow, Michael, 3,698,044.

Monsanto Company: *See—*
Alt, Gerhard H., 3,699,101.
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Chupp, John Paul, 3,698,887.
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Monsanto Research Corporation: *See—*
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Montecatini Edison S.p.A.: *See—*
Messina, Giuseppe; Montorsi, Giorgio; and Caprara, Giuseppe, 3,699,133.
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,699,145.

Montgomery, William C., Jr.; and Vogel, Charles B., to Shell Oil Company. Time-shared instantaneous gain-ranging amplifier. 3,699,325, Cl. 235-154.000.

Montgomery, William Lloyd, to Bell Telephone Laboratories, Incorporated. Echo suppression gate for digital code words including noise insertion. 3,699,273, Cl. 179-170.200.

Monti, Giancarlo, to Siai-Marchetti S.p.A. High-speed helicopter characterized by a lifting wing and by two engines fitted thereon. 3,698,666, Cl. 244-7.00a.

Montorsi, Giorgio: *See—*
Messina, Giuseppe; Montorsi, Giorgio; and Caprara, Giuseppe, 3,699,133.

Moon, Elmer: *See—*
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Moore Company, The: *See—*
Moore, Junius T., Jr., 3,698,676.

Moore, Emanuel M., to M & N Developers, Incorporated. Security attachment for chain type door lock. 3,698,751, Cl. 292-264.000.

Moore, Joseph B.; and Ather, Roy L., to United Aircraft Corporation. Apparatus for forging. 3,698,219, Cl. 72-38.000.

Moore, Junius T., Jr., to Moore Company, The. Assembly for structural framing unit. 3,698,676, Cl. 248-317.000.

Moore, William C.; and Pilgrim, William S., to Welch Allyn, Inc. Otoscope construction. 3,698,387, Cl. 128-9.

Morand, Gilles. Hair-slide. 3,698,403, Cl. 132-46.00r.

Morane, Bruno; Paoletti, Charles; and Hardoiin, Yves, to L'Oreal. Device for storing two liquids separately and dispensing them simultaneously under pressure. 3,698,453, Cl. 141-349.000.

Moreland, Stephen T. Continuous sausage manufacture. 3,698,916, Cl. 99-109.000.

Moretti, Peter A., to U.S. Oil Company Incorporated. Phosphonium compounds. 3,699,192, Cl. 260-926.000.

Morgan, George W., to Subsea Equipment Associates Limited, mesne. Method and apparatus for subsurface towing of flowlines. 3,698,348, Cl. 114-235.00b.

Morgan, John W.: *See—*
Jepson, Ivar; Morgan, John W.; and Richmond, James W., 3,699,282.

Morganite Research and Development Limited: *See—*
Zbrzezniak, Jozef, 3,698,865.

Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakazima, Jun, to Furukawa Electric Company Limited, The. Continuous winding apparatus. 3,698,652, Cl. 242-25.00a.

Morimoto, Michio: *See—*
Kohayakawa, Takashi; Yamamoto, Shinichi; and Morimoto, Michio, 3,698,873.

Morin, Richard A.; and Lanphier, Edward H., to United States of America, Navy. Pressure chamber closure. 3,698,591, Cl. 220-46.00r.

Morio, Minoru; and Kimura, Hiroyuki, to Sony Corporation. Color television receiver. 3,699,240, Cl. 178-5.40p.

Morita, Shigeru: *See—*
Mitsuyama, Masaru; and Morita, Shigeru, 3,698,371.

Moritz, Karl-Gunter: *See—*
Jost, Wolf-Dieter; and Moritz, Karl-Gunter, 3,698,731.

Morkoski, James; and Garriott, Louis B., Jr., to International Harvester Company. Steering compensator to alternately offset the tail wheel on semi-mounted tow-way plows. 3,698,486, Cl. 172-212.000.

Moro, Kazuo. Joint device. 3,698,209, Cl. 64-12.000.

Moroni Corporation: *See—*
Merrill, Alvin S.; and Rosenhan, Bill J., 3,698,091.
Rosenhan, Bill J., 3,698,092.

Morris, Earl L. Manifold body for a multi-person shower assembly. 3,698,020, Cl. 4-145.000.

Morris, Philip, Incorporated: *See—*
Lilly, Arnys Clifton, R.; and Tiller, Calvin O., 3,698,955.

Morrison, Adrian O., to North American Rockwell Corporation. Collapsible helical antenna. 3,699,585, Cl. 343-880.000.

Morrison, Steven, to United States of America, Navy, mesne. D.C. to A.C. converter with unique feedback demodulation. 3,699,423, Cl. 321-8.00r.

Morrow, Hugh, III: *See—*
Holtz, Frederick C., Jr.; and Morrow, Hugh, III, 3,698,055.

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Mott, Carl W.; deceased (by Mott, Elsie Viola; Mott, Carl Wheeler, Jr.; Hart, Elnora Mott; Battles, Dorothy Mott; Halgren, Phyllis Mott; and Mott, Elmer Samuel; heirs), to Mott Corporation. Blade connecting means. 3,698,168, Cl. 56-294.000.

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Steppe, Kenneth E.; and Webre, Alfred L., Jr., 3,698,949.
Ozawa, Shouiti: *See*—
Hatsuse, Toshikazu; Ueda, Hiromi; Ozawa, Shouiti; and Yasuda, Yuh, 3,699,412.
P. M. Products, Inc.: *See*—
Means, Lamoine E., 3,698,754.
Paddison, Eric; Wilson, Christopher George; and Gray, Frederick Martin, to English Electric Company, The. Selector circuit for determining faults in polyphase transmission systems. 3,699,431, Cl. 324-51.000.
Page, Harold Rodney Sven: *See*—
Wall, Reginald Victor; and Page, Harold Rodney Sven, 3,698,238.
Paget, Fredrick W., to Sylvania Electric Products, Inc. Control circuit for starting, sustaining and and operating arc lamps. 3,699,385, Cl. 315-239.000.
Palm, Gordon F. Water systems for phosphate plants. 3,699,212, Cl. 423-307.000.
Palm, Richard: *See*—
Cranskens, Georg; Krober, Gunther; and Palm, Richard, 3,698,804.
Palmberg, Paul W. Double pass coaxial cylinder analyzer with retarding spherical grids. 3,699,331, Cl. 250-49.5ae.
Palmer, Douglas B., to Western Electric Company, Incorporated. Bandwidth and center frequency testing using predetermined a amplitude pots. 3,699,434, Cl. 324-57.00r.
Palmer, Kenneth Norman, to National Research Development Corporation. Ventless equipment protection casing. 3,699,368, Cl. 310-88.
Pandel-Bradford, Inc.: *See*—
Wisotzky, Reuben; and Petersen, Richard E., 3,698,973.
Panter, Peter D.; Denis, Claude P-E; and Kaempf, Gerhard P., to Wolverine World Wide, Inc. Vision effective cutting and marking die. 3,698,028, Cl. 12-52.500.
Pantzer, Myron; and Feier, Milton, to Apod Corporation. Amino acid/phenylamine reactant-dyes for keratinous fibers and living hair. 3,698,852, Cl. 8-10.200.
Paoletti, Charles: *See*—
Morane, Bruno; Paoletti, Charles; and Hardoiin, Yves, 3,698,453.
Paone, Mary T. Iron rest. 3,698,674, Cl. 248-117.600.
Park-Ohio Industries, Inc.: *See*—
Griffith, Richard A., 3,699,302.
Parker, Harry W., to Phillips Petroleum Company. Retorting of nuclear chimneys. 3,698,478, Cl. 166-248.000.
Parker, James Daniel, III: *See*—
Illig, Howard Clayton; Lehder, Wilfred Emile, Jr.; Parker, James Daniel, III; Santacroce, Alfred Michael; and Sheridan, James Arthur, 3,698,533.
Parker, Ralph G., Jr.: *See*—
Koons, Edwin Russell; Parker, Ralph G., Jr.; and Rupley, Jeffery P., 3,698,880.
Parkin, William J., to Sanders Associates, Inc. Sensing and tracking apparatus. 3,699,345, Cl. 250-203.00r.
Parkinson, Alan R., to Goodyear Tire & Rubber Company, The. Process for forming carbamyl thiocarbamyl disulfides. 3,699,166, Cl. 260-567.000.
Parks, James D.: *See*—
Heal, David; and Parks, James D., 3,698,709.
Parone, Anthony D., to Pratt & Whitney Inc. Micrometer backlash adjustment device. 3,698,090, Cl. 33-164.000.
Parts, Leo P.: *See*—
Binning, Robert C.; Parts, Leo P.; Peresie, Robert J.; and Rodenburg, Margaret L., 3,699,210.
Pascoe, Peter; Josten, Friedrich; Haferkamp, Wilhelm; and Lucker, Willi, to Deutsche Texaco Aktiengesellschaft. Hydrolysis of aluminum alcoholates. 3,698,861, Cl. 23-143.000.
Pasetti, Adolfo: *See*—
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,699,145.
Pate Foods, Inc., mesne: *See*—
Glasgow, Colin F., 3,698,915.
Patil, Arvind S.; and Ashby, George E., to Grace, W. R., & Co. Method for the preparation of alumina silver composites. 3,698,891, Cl. 75-206.000.
Patin, Pierre C. Stabilised three-wheel vehicle. 3,698,502, Cl. 180-27.000.
Paul, Igor L., to Ames, B. C., Company. Dial indicators. 3,699,473, Cl. 55-17.0rr.
Paul, William T.; and Tracy, Wayne R., to North American Rockwell Corporation. Roller chain disconnector apparatus. 3,698,181, Cl. 59-11.000.
Paulson, Donald C., to New Britain Machine Company, The. Plastics injection-molding machine utilizing premixed billets. 3,698,845, Cl. 425-145.000.
Paulus, Rudolf; and Huber, Hans-Peter, to Agfa-Gevaert Aktiengesellschaft. Arrangement for determining frame lengths on film strips. 3,699,349, Cl. 250-219.0fr.
Payrhammer, Bernd, to Marker, Hannes. Toe iron for safety ski bindings. 3,698,732, Cl. 280-11.35t.
Peaker, Charles R., to Uniroyal, Inc. Coating compositions and coated articles. 3,699,069, Cl. 260-29.7sq.
Peckels, Kenneth T.: *See*—
Lerew, Wilford J.; and Peckels, Kenneth T., 3,698,675.
Peek, Ellis, Jr. Fruit harvester. 3,698,579, Cl. 214-83.100.
Peel, Robert; and Northup, Francis B. Yarn covering apparatus. 3,698,173, Cl. 57-18.000.
Pellegrini, Armando Paulo. Process for the prodiction of dry molasses from sugar-cane or beetroot molasses. 3,698,911, Cl. 99-6.000.
Pelz, Diethart: *See*—
Matthieu, Paul; Leuchs, Ottmar; Glander, Fritz; Kuypers, Hubert; and Pelz, Diethart, 3,698,440.
Pepelnik, Rudolf: *See*—
Hick, Harald Peter; and Pepelnik, Rudolf, 3,699,340.
Peppin, Richard A.; and Trottochau, Lawrence D., to Mannix Construction Inc. Machine for inserting ties beneath a railroad track. 3,698,324, Cl. 104-9.000.
Percher, Guy, to Societe d'Instrumentation Schlumberger. Method and apparatus for addressing different data points from a central station. 3,699,523, Cl. 340-172.500.
Peresie, Robert J.: *See*—
Binning, Robert C.; Parts, Leo P.; Peresie, Robert J.; and Rodenburg, Margaret L., 3,699,210.
Perez, Arthur, to Clark Equipment Company. Walk-in cooler refrigerated display case combination. 3,698,205, Cl. 62-256.000.
Perez, Frank, Jr.: *See*—
Midulla, Guiseppe, 3,699,046.
Perkin-Elmer Corporation, The: *See*—
Condon, Richard D., 3,698,869.
Scott, Roderic M., 3,699,245.
Perkin-Elmer Limited: *See*—
Leane, John Bryant; and Higham, Peter, 3,699,428.
Perkins Research & Mfg. Co.: *See*—
Bennett, Richard L., 3,699,274.
Pero, Vincent C. Baseball pitching practice device. 3,698,712, Cl. 273-26.00a.
Perron, James S.: *See*—
Fassler, Michael H.; and Perron, James S., 3,698,467.
Perry, James L., to Union Carbide Corporation. Cryogenic storage apparatus. 3,698,589, Cl. 220-14.000.
Petering, John L.: *See*—
Johnson, Glenn B.; and Petering, John L., 3,698,200.
Peters, Karl-Heinz; and Neeff, Rutger, to Farbenfabriken Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,699,126, Cl. 260-329.200.
Peters, Philip H., Jr.; and Wilbur, Donald A. Expandable bandwidth radar jammer. 3,699,575, Cl. 343-18.00e.

Peters, Timothy Victor. Processes of producing stable filaments of linear polyurethanes. 3,699,205, Cl. 264-210.00f.

Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of ureidomethylphosphonyl halides. 3,699,102, Cl. 260-251.00p.

Petersen, Richard E.: *See—*
Wisotzky, Reuben; and Petersen, Richard E., 3,698,973.

Peterson, Henry W.: *See—*
Wyzalek, Leonard J.; and Peterson, Henry W., 3,698,476.

Peterson, Ralph M., to Peterson-Kruse, Inc. Power operated can opener. 3,698,084, Cl. 30-4.00r.

Peterson, Wesley D.; and Southworth, Donovan A., to Collins Radio Company. Rugged, narrow bandwidth mechanical filter. 3,699,483, Cl. 333-71.000.

Peterson-Kruse, Inc.: *See—*
Peterson, Ralph M., 3,698,084.

Petrey, Ernest Q., Jr., to Drew Chemical Corporation. Coolant system and corrosion inhibitor and method of use. 3,699,047, Cl. 252-175.000.

Petrey, Ernest Quentin, Jr.; and Werner, Ronald M., to Drew Chemical Corporation. Corrosion inhibitor composition containing a glycine, chelating agent, phosphoric or boric acid ester, and a water soluble divalent metal salt. 3,699,052, Cl. 252-389.000.

Petri, Nelli J. Means for securing an insert to a base piece. 3,698,748, Cl. 287-20.300.

Petro-Tex Chemical Corporation: *See—*
Nagel, Roger M., 3,699,090.

Petrolite Corporation: *See—*
Heintzelman, William J.; and Naiman, Michael I., 3,699,154.

Peytavin, Pierre, to Societe Anonyme dite: Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Intermittently acting rolling mill. 3,698,225, Cl. 72-208.000.

Pfabe, Peter: *See—*
Kirchhoff, Horst-Guenter; Pfabe, Peter; and Sedlmayr, Gerhard, 3,698,657.

Pfizer Inc.: *See—*
Butler, Kenneth; Conover, Lloyd H.; and Woodward, Robert B., 3,699,117.
Robba, William A.; and Conabee, Earl E., 3,698,646.

Phelan, Louis A. M.: *See—*
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Phelps Dodge Magnet Wire Corporation: *See—*
Koerner, Ernest C.; Trice, Robert T.; and Wareham, William W., 3,699,082.

Phelps, Rex V., to Warren Petroleum Corporation. Deep-water drilling, production and storage system. 3,698,198, Cl. 61-46.500.

Philbrook, James E.: *See—*
Thunberg, Jon C.; and Philbrook, James E., 3,699,214.

Philco-Ford Corporation: *See—*
Berenbaum, Arthur; and McDonough, Rort M., 3,699,453.
Shelby, Rufus F., 3,699,359.

Philippe, Nicodeme, to Bendix Corporation, The. Warning device for a split fluid pressure braking system. 3,699,513, Cl. 340-52.00c.

Phillip Petroleum Company: *See—*
Wood, Harold V.; and Brown, Terry D., 3,699,087.

Phillips Petroleum Company: *See—*
Brady, Donnie G., 3,699,155.
Parker, Harry W., 3,698,478.
Trepka, William J., 3,699,055.
Turner, Edward W., 3,699,201.

Photis, James Mitchell: *See—*
Fine, Leonard Wolfe; Matsuda, Ken; and Photis, James Mitchell, 3,699,164.

Picek, Charles Richard; and van Hoek, Cornelis, to American Machine & Foundry Company. Evaporating-concentrating apparatus and method. 3,699,007, Cl. 203-40.000.

Pierce, George W. Cable claw attachment. 3,698,047, Cl. 24-238.000.

Pierce, Guy Donald; and Runft, Rudi K., to Cross Company, The. Gage head. 3,698,056, Cl. 29-201.000.

Pierce, John Robinson: *See—*
Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, 3,699,271.

Pilgrim, William S.: *See—*
Moore, William C.; and Pilgrim, William S., 3,698,387.

Pinnow, Douglas A.; and Van Uitert, Le Grand G., to Bell Telephone Laboratories, Incorporated. Display system. 3,699,478, Cl. 332-7.510.

Pinsley, Edward A.: *See—*
Mulread, Richard C.; and Pinsley, Edward A., 3,699,471.

Pinson, Lyndon D.: *See—*
Werlein, Eugene R.; Hollingsworth, John W.; and Pinson, Lyndon D., 3,699,231.

Pinto, Jane P.: *See—*
GaLasso, Francis S.; Jacob, Bernarr A.; and Pinto, Jane P., 3,698,970.

Pioneer Magnetics, Inc.: *See—*
Wilkinson, Bruce L., 3,699,358.

Piper, William S.; and Polak, Teodor. Electrically heated hypodermic needle. 3,698,394, Cl. 128-303.100.

Pitchford, Richard L., to Bausch & Lomb Incorporated. Cross cylinder flip mechanism. 3,698,799, Cl. 351-28.000.

Pitha, John J., to General Electric Company. Porous ceramic insulating material and method of making employing wax. 3,698,920, Cl. 106-41.000.

Pitney-Bowes, Inc.: *See—*
Du Bois, Robert Clark; Mikan, Donald G.; and Miller, Wayne H., 3,698,356.

Pitroda, Satyan G.; and Rekiere, Bernard J., to GTE Automatic Electric Laboratories, Incorporated. Conference circuit for pulse code modulated telephony. 3,699,264, Cl. 179-18.0bc.

Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Treatment of textile fibers. 3,698,856, Cl. 8-115.500.

Plastek Company: *See—*
Muhler, Joseph C., 3,698,388.

Plasynski, Joseph E.; and Jerabek, Robert D., to PPG Industries, Inc. Use of coke in electrodepositable compositions. 3,699,009, Cl. 204-181.000.

Plattner, Robert F.; and Kocian, James A., to Interlake, Inc. Strapping machine. 3,698,310, Cl. 100-4.000.

Platzoder, Karl: *See—*
Reuschel, Konrad; Platzoder, Karl; and Kursawe, Helga, 3,698,354.

Plessey Company Limited, The: *See—*
Thompson, Raymond; and Guest, Ashley W., 3,699,479.

Plessey Handel und Investments A.G.: *See—*
Wall, Reginald Victor; and Page, Harold Rodney Sven, 3,698,238.

Ploinikoff, Nicholas Peter, to Abbott Laboratories. 2-Oxo-5-phenyl-4-oxazolidinone as an antidepressant agent. 3,699,229, Cl. 424-272.000.

Plourde, Leonard J.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.

Plunk, Troy E.: *See—*
O'Hara, Francis J.; and Plunk, Troy E., 3,699,574.

Pluta, Linda J.; and Vossos, Peter H., to Nalco Chemical Corporation. Process for making silica organosols. 3,699,049, Cl. 252-309.000.

Poeste, Hans-Peter: *See—*
Vogt, Gerd; and Poeste, Hans-Peter, 3,698,466.

Pogge, Hans B.: *See—*
Kemlage, Bernard M.; and Pogge, Hans B., 3,698,947.

Pogorski, Louis A., 55% to British American Oil Company Limited, The and 45% to Chemical Projects Limited. Thermally insulated device. 3,698,588, Cl. 220-9.00c.

Polak, Teodor: *See—*
Piper, William S.; and Polak, Teodor, 3,698,394.

Polakoqski, Stanley J.: *See—*
Dahlquist, Ernst A.; Polakoqski, Stanley J.; and Vaalburg, Teunis, 3,698,423.

Polanyi, Michael L., to American Optical Corporation. Disposable cuvettes for calorimetry. 3,698,822, Cl. 356-246.000.

Polaroid Corporation: *See—*
Grasshoff, J. Michael; and Taylor, Lloyd D., 3,698,898.
Johnson, Edward J., Jr., 3,698,900.

Polevy, John H.: *See—*
Holland, Dewey G.; Moyer, Ronald C.; Polevy, John H.; and Walde, Robert A., 3,699,156.

Polymer Research Corporation: *See—*
Horowitz, Carl, 3,698,931.

Poncet, Pierre. Screw mixers. 3,698,693, Cl. 259-5.000.

Portec, Inc.: *See—*
Hamilton, William R., Jr., 3,698,634.

Portugall, Peter, to International Standard Electric Corporation. Key switch for chatterless switching. 3,699,293, Cl. 200-166.00h.

Poskin, Irvin C. Staple lifter with gripping jaws. 3,698,689, Cl. 254-28.000.

Potts, Vinson S., to Crown Cork & Seal Company, Inc. Necked-in container. 3,698,596, Cl. 220-670.000.

Poumakis, Eleuthere: *See—*
Schaffer, Harry G.; Neilson, Dan A.; and Poumakis, Eleuthere, 3,699,532.

Power Designs, Inc.: *See—*
Silver, Arthur E., 3,699,352.

Power-Curve Conveyor Company: *See—*
Dahlem, Billy J.; and Martin, John A., 3,698,572.

Powercube Corporation: *See—*
Schuler, Chester L., 3,699,394.

PPG Industries, Inc.: *See—*
Plasynski, Joseph E.; and Jerabek, Robert D., 3,699,009.

Pranke, John A., to Theta-Com of California, mesne. Self-balancing push pull amplifier. 3,699,465, Cl. 330-15.000.

Prasse, Herbert F., to Ramsey Corporation. Method of making oil control piston rings. 3,698,054, Cl. 29-156.630.

Pratt & Whitney Inc.: *See—*
Parone, Anthony D., 3,698,090.

Pray, Lester W.; and Zerfoss, Clinton C., to Maremont Corporation. Bobbin tube delivery means. 3,698,536, Cl. 198-26.000.

Precision Extrusions, Inc.: *See—*
Ziehm, Kurt F., Jr.; and Markiewicz, James E., 3,698,700.

Preston Engravers, Inc.: *See—*
Kesten, Martin; and O'Connor, Ralph Bruce, 3,698,271.
Kesten, Martin; and O'Connor, Ralph Bruce, 3,698,272.

Price, Carl. Pump impeller housing with integral flow regulator. 3,698,832, Cl. 415-148.000.

Price, Edgar E. Electro-optical display system. 3,699,242, Cl. 178-5.4bd.

Price, William C.: *See—*
Carlson, Carl B.; McKeeman, William M.; and Price, William C., 3,699,528.

Procter & Gamble Company, The: *See—*
Connor, Daniel S.; and Krummel, Harry Karl, 3,699,159.
Maag, Gustav A.; and Gerth, Donald L., 3,698,097.

Progil: *See—*
Gerin, Paul; Louat, Lucien; and Quillet, Jean-Pierre, 3,699,215.

Pryor, Michael J.: *See—*
Caule, Elmer J.; Sperry, Philip R.; Pryor, Michael J.; and Ford, James A., 3,698,964.

Pulliam, William D. Automatic washing apparatus. 3,698,029, Cl. 15-21.00d.

Pulman, Leonard J.: *See—*
Fekete, Frank; Thrash, David J.; and Pulman, Leonard J., 3,698,981.

Puma, Maurice J.: *See—*
Bielefeld, Ewald J., Jr.; and Puma, Maurice J., 3,698,867.

Purdue Research Foundation: *See—*
Benkeser, Robert A.; and Smith, William E., 3,699,141.
Benkeser, Robert A.; and Smith, William E., 3,699,142.
Benkeser, Robert A.; and Gaul, James M., 3,699,143.
Whistler, Roy L., 3,699,170.

Putt, James Basil, to Bendix Corporation, The. Shunt actuated fluid level sensor. 3,699,561, Cl. 340-244.00e.

Putter, Irving, to Merck & Co., Inc. Selective deuteration of tyrosive, aspartic and glutamic acids. 3,699,158, Cl. 260-519.000.

Pyramid, Inc.: *See—*
Smith, Thomas R., 3,698,111.

Quillet, Jean-Pierre: *See—*
Gerin, Paul; Louat, Lucien; and Quillet, Jean-Pierre, 3,699,215.

Quillinan, John H.; and Mackey, Edward F., to General Electric Company. Muzzle flash detector. 3,699,341, Cl. 250-83.30h.

Quinlan, Joseph B.; and Van Artsdalen, Earl F., to United States of America, Army. High temperature-resistant waterproof caseless primer. 3,698,319, Cl. 102-45.000.

Quisling, Sverre. Discovery in solution dispensers. 3,698,605, Cl. 222-190.000.

Rabenhorst, David W., to Hopkins, John, University, The. Fixed element rotor structures. 3,698,262, Cl. 74-572.000.

Rabinow, Jacob: *See—*
Apstein, Maurice; Blomgren, Evert; Keehn, George R.; Andrews, Laurence M.; and Rabinow, Jacob, 3,698,323.

Rabussier, Bernard; Mandon, Jean Pierre; and Hennart, Claude, to Ciba-Geigy AG. Process for the manufacture of apparatus for emitting of insecticidal vapors. 3,698,974, Cl. 156-87.000.

Radcliffe, Richard J., to Ebco Manufacturing Company. Water-distributing system for a hot and cold drinking water dispenser. 3,698,603, Cl. 222-146.00r.

Radig, Gary A.; Rowell, Cliva A., Jr.; and Edwards, Harvey R., to Cook Testing Co. Running-in tool forells. 3,698,477, Cl. 166-214.000.

Radin, William: *See—*
Hartling, Donald C.; Joseph, Hawthorne; and Radin, William, 3,698,125.

Radner, Raymond John: *See—*
De Fabritis, Raymond P.; Fefferman, Gerald Burt; Gesner, Bruce David; and Radner, Raymond John, 3,699,552.

Ragsdale, Charles W., to United States of America, Army. One-shot monostable multivibrator. 3,699,360, Cl. 307-273.000.

Rainal, Attilio Joseph, to Bell Telephone Laboratories, Incorporated. Apparatus for measuring low level power. 3,699,450, Cl. 325-363.000.

Raion Yushi Kabushiki Kaisha: *See—*
Susuki, Rinnosuke; and Hoshi, Hiroshi, 3,698,977.

Ramsay, James M., to United States of America, Navy. Method for drying articles having a low heat tolerance. 3,698,098, Cl. 34-15.000.

Ramsey Corporation: *See—*
Prasse, Herbert F., 3,698,054.

Ramsey Engineering Company: *See—*
Schaaf, Gunther; and Smith, Nathan R., 3,699,503.

Randall, David I.; and Vogel, Calvin, to GAF Corporation. Production of diesters of 2-hydroxyethyl phosphonic acid. 3,699,195, Cl. 260-970.000.

Ransburg Electro-Coating Corporation: *See—*
Miller, Emery P., 3,699,027.
Sickles, James E., 3,698,635.

Rapistan Incorporated: *See—*
Dahlquist, Ernst A.; Polakoqski, Stanley J.; and Vaalburg, Teunis, 3,698,423.

Rapoport, Lev Moiseevich: *See—*
Mikhailov, Nikolai Petrovich; Rapoport, Lev Moiseevich; and Taits, Samuil Zalmanovich, 3,698,235.

Rapp, Robert Anthony, to Ohio State University, The. Devices for the control of agents in fluids. 3,699,032, Cl. 204-195.00s.

Rapson, William H., to Electric Reduction Company of Canada, Ltd. Digestion and bleaching wood pulp followed by recovery of chemicals and countercurrent flow of wash water. 3,698,995, Cl. 162-19.000.

Rattey, Wilfred H., Jr. Board game apparatus. 3,698,716, Cl. 273-134.0ae.

Ratz, Walter, to Bergwerksverband GmbH. Method and apparatus for testing geological strata for identification thereof. 3,699,429, Cl. 324-5.000.

Rauh, John H., to Sonix, Inc. Sound deadening sheet material. 3,698,993, Cl. 161-159.000.

Rauner, Frederick J.: *See—*
Baptista, John L.; Rauner, Frederick J.; and Ford, John A., Jr., 3,699,135.

Rauskolb, Fred W., to Standard International Corporation. Combustion mixture control system for calenders. 3,698,696, Cl. 263-6.00c.

Ray, Jack C.: *See—*
Sanderford, Freeman M.; and Ray, Jack C., 3,699,041.

Ray, Jimmy C. Sleeve slitter. 3,698,085, Cl. 30-90.400.

Raynor, Terence Robert, to AMP Incorporated, mesne. Electrical connector for vehicle instruments. 3,699,495, Cl. 339-17.00c.

Raytheon Company: *See—*
Heimann, Richard F., 3,699,531.
Klein, Stanley Frank, 3,699,535.

Razelton, Donald R.: *See—*
Johnson, Duane M.; and Razelton, Donald R., 3,698,968.

RCA Corporation: *See—*
Alphonse, Gerard Argant, 3,698,794.
Beyers, Billy Wesley; and Tretter, Larry Lee Roy, 3,699,529.
Bokeky, Edward Joseph, III, 3,699,403.
Boleky, Edward Joseph, 3,699,395.
Dodd, John A., Jr.; and Geshner, Robert A., 3,698,903.
Giaimo, Edward Charles, Jr., 3,699,335.
Gronka, Edward Anthony, 3,698,786.
Harwood, Leopold Albert; and Wittmann, Erwin Johann, 3,699,257.
Hunter, Gregory Michael, 3,699,533.
Kelly, Gordon Emmet, 3,699,562.
Madrazo, Charles Felix; Fulcher, Edwin Maxwell; and McDonagh, Kevin Patrick, 3,699,355.
Mancini, Ronald Alfred, 3,699,476.
Marsh, James Courtland, Jr., 3,699,400.
Miller, Michael Evans, 3,699,268.
Sorkin, Howard; and Klein, Richard Ira, 3,698,449.
Tietjen, James Joseph; Williams, Brown F.; and Wang, Chin Chun, 3,699,401.
Warner, Clifford George; and Kade, James Henry, 3,698,057.

RCS Corporation: *See—*
Simon, Ralph E.; and Williams, Brown F., 3,699,404.

Readio, Philip D.: *See—*
Schrage, Albert; and Readio, Philip D., 3,699,186.

Redden, Robert J., to ILC Industries, Inc. Fabric connector. 3,698,045, Cl. 24-203.000.

Redington, Rowland W., to General Electric Company. Diode array storage system having a self-registered target and method of forming. 3,698,078, Cl. 29-578.000.

Reed, Geoffrey R., to British Iron and Steel Research Association, The. Packaging. 3,698,152, Cl. 53-27.000.

Reeg, Cloyd P.: *See—*
Hass, Robert H.; and Reeg, Cloyd P., 3,699,036.

Reenstray, John E.; and Malone, Martin. Heat sealing apparatus. 3,699,305, Cl. 219-200.000.

Reese, Walter H.: *See—*
Koontz, Raymond A.; and Reese, Walter H., 3,698,409.

Reeves, Keith Clarkson, to General Motors Corporation. Relating to energy absorbing shafts and method of making same. 3,698,259, Cl. 74-492.000.

Reger, Herbert; and Heinrich, Hans-Walter, to Bosch, Robert, G.m.b.H. Conveying arrangement. 3,698,542, Cl. 198-225.000.

Regie Nationale des Usines Renault: *See—*
Chatourel, Pierre; and Lefebvre, Jean, 3,698,471.

Reichardt, Theodore A. Photographic print and film processing machine. 3,698,307, Cl. 95-93.000.

Reichhold-Albert-Chemie Aktiengesellschaft: *See—*
Behrens, Burkhard; and Delius, Hermann, 3,699,022.

Reid, James S., to Thermasan Corporation, mesne. Method for waste disposal with centrifugal action. 3,699,040, Cl. 210-32.000.

Reiling, Victor G.: *See—*
Freed, Jacob B.; and Reiling, Victor G., 3,698,422.

Reimann, Hubertus; and Lindner, Fritz, to Kombinat Veb Pentacon Dresden Kamera- und Kinowerke. Apparatus for meterless exposure value indication. 3,698,301, Cl. 95-10.00c.

Reimer, Leonard H., to Cessna Aircraft Company, The. Neutral control for hydraulic transmission. 3,698,189, Cl. 60-53.00r.

Reimer, William A.; and Storz, Frederick G., to GTE Automatic Electric Laboratories, Incorporated. Apparatus for applying with clamp terminal clip of the flanged tubular type. 3,698,058, Cl. 29-203.0hc.

Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Printed wiring card file. 3,699,393, Cl. 317-99.000.

Reinheimer, Harry J., to International Business Machines Corporation. Error detecting and correcting system and method. 3,699,323, Cl. 235-153.000.

Reitz, Lewis P., Jr., to Technicolor, Inc. Pan scan system. 3,698,806, Cl. 355-40.000.

Reitzel Designs, Inc.: *See—*
Reitzel, John S.; and Reitzel, Gail L., 3,698,124.

Reitzel, Gail L.: *See—*
Reitzel, John S.; and Reitzel, Gail L., 3,698,124.

Reitzel, John S.; and Reitzel, Gail L., to Reitzel Designs, Inc. Construction toy. 3,698,124, Cl. 46-30.000.

Rekiere, Bernard J.: *See—*
Pitroda, Satyan G.; and Rekiere, Bernard J., 3,699,264.

Remvac System Corporation: *See—*
Dunbar, Robert A., 3,699,311.

Republic Corporation: *See—*
Smith, Vern; Fallon, Merton R.; and Johnston, Mack S., 3,698,417.

Reuschel, Konrad; Platzoder, Karl; and Kursawe, Helga, to Siemens Aktiengesellschaft. Device for indiffusing dopants into a semiconductor material. 3,698,354, Cl. 118-49.100.

Reusser, Raymond E., to Western Electric Company, Incorporated. Breakout protection for crystal growers. 3,698,872, Cl. 23-273.0sp.

Reynolds, John: *See—*
Stromberg, Carl E.; and Reynolds, John, 3,698,858.

Reynolds Metals Company: *See—*
Cvacho, Daniel S.; Fastabend, Patrick A.; Garriques, Alfred L.; and Jensen, Eric L., 3,698,593.
Joyce, John Frederick; and Daugherty, T. Stevens, 3,699,196.

Reynolds, Robert W.; and Wight, George P., to Clary Corporation. Attitude indicating instrument. 3,698,823, Cl. 356-250.000.

Rhodes, Charles F., Jr., to Sun Oil Company. Memory circuit for chromatographs. 3,698,237, Cl. 73-23.100.

Rice, Roy W.: *See—*
United States of America, National Aeronautics and Space Administration, 3,698,848.

Rich Tool & Die Company: *See—*
Richard, Yvon L.; and Wojchlwski, Charles, 3,698,273.

Richard, Yvon L.; and Wojchlwski, Charles, to Rich Tool & Die Company. Automatic punch press for flexible metal band. 3,698,273, Cl. 83-183.000.

Richards, Bernardine J.; and O'Neil, Bernadette T. Article of clothing. 3,698,015, Cl. 2-105.000.

Richardson, Gayle Darwin. Eze-Wire and cable puller. 3,698,059, Cl. 29-203.00h.

Richmond, James W.: *See—*
Jepson, Ivar; Morgan, John W.; and Richmond, James W., 3,699,282.

Rieker, Justus. Ski boot. 3,698,106, Cl. 36-2.5al.

Riley, John A., to Westinghouse Electric Corporation. Bi-directional signal detector with input/output isolation. 3,699,442, Cl. 324-98.000.

Rimar S.p.A.: *See—*
Garzotto, Felice, 3,698,211.

Ring, Gene C.: *See—*
Katerndahl, Dean R.; Wilson, Earl D.; Macalalad, Fidel V.; and Ring, Gene C., 3,698,396.

Rippingille, Edward V., Jr.: *See—*
Chi Kai Kwok, Clyde, 3,698,416.

Ritchie, Henry: *See—*
Leatherman, Ralph W., 3,699,285.

Rittenhouse, Howard E. Thrust piston fluid meters. 3,698,246, Cl. 73-258.000.

Robba, William A.; and Conabee, Earl E., to Pfizer Inc. Composite carbon insert for gas shielded welding torch nozzle. 3,698,646, Cl. 239-591.000.

Roberts, David C., to International Business Machines Corporation. Low cost raster scanned data consolidation. 3,699,536, Cl. 340-172.500.

Roberts, George S., to Big George, Inc. Process control circuitry. 3,699,363, Cl. 307-308.000.

Roberts, John A.; and Roberts, Peter R., to Brunswick Corporation. Fibrous metal filaments. 3,698,863, Cl. 29-183.500.

Roberts, John T.; and Wing, Ralph L. Packaging apparatus, method and bags. 3,698,547, Cl. 206-57.000.

Roberts, Melvin F.: *See—*
Bloomfield, Harold; and Roberts, Melvin F., 3,698,735.

Roberts, Peter R.: *See—*
Roberts, John A.; and Roberts, Peter R., 3,698,863.

Robertson, Glenn D., Jr.: *See—*
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Robertson, H. H., Company: *See—*
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Robins, A. H., Company, Incorporated: *See—*
Beauchamp, Robert Owens, Jr.; Ward, John Wesley; and Franko, Bernard Vincent, 3,699,230.
Helsley, Grover Cleveland, 3,699,105.

Robinson, Allan B., to Mobil Oil Corporation. Bag support assembly. 3,698,155, Cl. 53-390.000.

Robinson, Keith D., to Goodyear Tire and Rubber Company, The. Method of making shaped articles. 3,699,198, Cl. 264-96.000.

Robinson, Peter T., to Motorola, Inc. High speed machine for bonding frame leads to bonding pads on circuit chips. 3,698,985, Cl. 156-379.000.

Rockwell, Lowell K.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.

Rodenburg, Margaret L.: *See—*
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Rodriguez, Juan A.: *See—*
Harter, James E.; and Rodriguez, Juan A., 3,698,809.

Roever, Wilhelm; Junghanss, Helmut; and Kauczor, Hans-Werner, to Farbenfabriken Bayer Aktiengesellschaft. Process for the purification of cadmium solutions. 3,699,207, Cl. 75-101.0be.

Rogers, Paul C.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.

Rogers, Robert G., to GTE Automatic Electric Laboratories, Inc. Double-mode tuned microwave oscillator. 3,699,475, Cl. 331-101.000.

Rogg, Herman O.: *See—*
Martin, Harold B.; and Rogg, Herman O., 3,698,276.

Rohdenizer, Harold L.: *See—*
Mersereau, Mark; Rohdenizer, Harold L.; Grunwald, John J.; and Innes, William P., 3,698,940.

Rohr, Alton J.; and McKeown, Cornelius J., to United States of America, Army. Apparatus and method for the disposal of liquid waste material. 3,698,331, Cl. 110-7.00r.

Rollei-Werke Franks & Heidecke: *See—*
Albrecht, Hermann Friedrich; and Strauss, Karl Peter, 3,699,427.

Roome, Theodore F., Jr.: *See—*
Tauscher, Kenneth E.; Roome, Theodore F., Jr.; and Coon, David S., 3,699,449.

Rose, Bennie A., to Heyl and Patterson, Inc. Apparatus for crushing large lumps of coal and the like. 3,698,648, Cl. 241-33.000.

Rose, Howard L.: *See—*
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Rose, William Henry: *See—*
Lockard, Joseph L.; and Rose, William Henry, 3,699,279.

Rose-Miller, Brigadier George Patrick. Method for handling feeding devices for young animals. 3,698,952, Cl. 134-22.00r.

Rosen, Harold A.: *See—*
Hudspeth, Thomas; and Rosen, Harold A., 3,699,454.

Rosenberg, Norman: *See—*
Kamins, Seymour; Rosenberg, Norman; and Bentsen, Per, 3,698,289.

Rosenberg, Robert B.; Kweller, Esher R.; and Staats, William R., to Institute of Gas Technology. Smooth top gas range. 3,698,378, Cl. 126-39.

Rosenburgh, Norman John, to Eastman Kodak Company. Self-threading take-up device. 3,698,654, Cl. 242-74.000.

Rosenhan, Bill J.: *See—*
Merrill, Alvin S.; and Rosenhan, Bill J., 3,698,091.

Rosenhan, Bill J., to Moroni Corporation. Illuminated gun sights for small arms. 3,698,092, Cl. 33-241.000.

Rosier, Stewart N. Fish bite signaling device. 3,698,116, Cl. 43-17.000.

Rosinski, Edward J.: *See—*
Rubin, Mae K.; and Rosinski, Edward J., 3,699,139.

Rossi, Silvano, to Roussel-UCLAF. Carboxamides of benzotriazepines. 3,699,098, Cl. 260-239.30b.

Rostad, Nels C., to Lockheed Aircraft Corporation. Apparatus and method for sequencing the folding and unfolding of rotor blades in a compound vehicle. 3,698,662, Cl. 244-7.00a.

Rotary Hoes Ltd.: *See—*
Trimpe, Clarence W.; and Beldon, Roy A., 3,698,485.

Roth, Robert Richard: *See—*
Yoder, Alfred Dean; and Roth, Robert Richard, 3,698,488.

Roth, Stanley F.: *See—*
Eichhorn, Jacob; and Roth, Stanley F., 3,698,934.

Roth, Stephen A., to Tektronix, Inc. Circuit for accurately detecting the time of occurrence of a waveform. 3,699,256, Cl. 178-69.5tv.

Roussel-UCLAF: *See—*
Nedelec, Lucien; and Gasc, Jean-Claude, 3,699,100.
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Roussos, Michel: *See—*
Henri, Richaud; and Roussos, Michel, 3,699,019.

Rowell, Cliva A., Jr.: *See—*
Radig, Gary A.; Rowell, Cliva A., Jr.; and Edwards, Harvey R., 3,698,477.

Rowley, Kermit G., to Tenneco Oil Company. Well conduit treating apparatus. 3,698,474, Cl. 166-90.000.

Roy, Fernand. Door lock guard. 3,698,217, Cl. 70-451.000.

Rozmus, Walter J., to Kelsey Hayes Company, mesne. Valve assembly. 3,698,438, Cl. 137-625.460.

Rubelsky, William C.: *See—*
Midulla, Guiseppe, 3,699,046.

Rubelsky, William P.: *See—*
Midulla, Guiseppe, 3,699,046.

Rubico, Jerome A.; and Batchelder, Charles F., to Batchelder Rubico, Inc. Lasting element. 3,698,105, Cl. 36-2.50r.

Rubin, Leonard R., to Engelhard Minerals & Chemicals Corporation. Method of producing a composite electrode. 3,698,050, Cl. 29-25.180.

Rubin, Mae K.; and Rosinski, Edward J., to Mobil Oil Corporation. Synthetic crystalline aluminosilicate. 3,699,139, Cl. 260-448.

Rubricius, Jeanette L. Small animal cage. 3,698,360, Cl. 119-17.000.

Rudolph, Hans: *See—*
Hermann, Karl-Heinz; Schneider, Joachim; Rudolph, Hans; and Nawrath, Gunter, 3,699,183.

Ruff, Joseph N.: *See—*
Shira, Glenn L.; and Ruff, Joseph N., 3,698,318.

Runft, Rudi K.: *See—*
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Runyon, David Jon: *See—*
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Rupley, Jeffery P.: *See—*
Koons, Edwin Russell; Parker, Ralph G., Jr.; and Rupley, Jeffery P., 3,698,880.

Rupp, Hans-Dieter: *See—*
Magerlein, Helmut; Meyer, Gerhard; and Rupp, Hans-Dieter, 3,699,161.

Ruse, Alois, to Hartmann & Braun Aktiengesellschaft. Gas analyzer and mist separator. 3,698,159, Cl. 55-257.000.

Rutenberg, Morton Wolf: *See—*
Tessler, Martin Melvyn; and Rutenberg, Morton Wolf, 3,699,095.

Ruth, Harold C.; and Thompson, James W., to A-T-O Inc., mesne. Road maintainer attachment. 3,698,487, Cl. 172-305.000.

Rutz, Elisabeth M., to International Business Machines Corporation. Optical pulse communication system using a pseudo-random sequence for synchronization. 3,699,344, Cl. 250-199.000.

Ryer, Dudley A., Jr.: *See—*
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Rygelis, Joseph: *See—*
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Rynn, John Munro William: *See—*
Stacey, Frank Donald; Rynn, John Munro William; and Little, Eric Cooper, 3,698,094.

Saddler, Rupen L. Cloth article provided with test tab. 3,698,016, Cl. 2-243.00r.

Sagara, Hideo, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for spirally winding strip metal. 3,698,223, Cl. 72-146.000.

Sainte-Beuve, Philippe, to U.S. Philips Corporation. Differential pulse code modulation system with clycic, dynamic decision level changing. 3,699,446, Cl. 325-38.00a.

Saito, Tadashi: *See—*
Maruyama, Shoji; Saito, Tadashi; Yoshida, Shigeaki; and Shimada, Masaru, 3,699,000.

Sakamoto, Eiichi: *See—*
Sakazume, Kaiichiro; Ito, Shigemasa; Sato, Shui; Sakamoto, Eiichi; and Oshima, Akio, 3,698,910.

Sakamoto, Toemon, to Enshu Limited. Weft controller usable for a weaving loom of weft propellent fluid jet type. 3,698,442, Cl. 139-127.00p.

Sakazume, Kaiichiro; Ito, Shigemasa; Sato, Shui; Sakamoto, Eiichi; and Oshima, Akio, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 3,698,910, Cl. 96-122.000.

Sakurai, Fujio: *See—*
Oshima, Keiji; Yamada, Shozo; Sakurai, Fujio; Iwasa, Yoshisuke; Horiuchi, Koichi; Uchida, Unosuke; Nomura, Teruhiko; and Tominaga, Yasushi, 3,699,203.

Salfer, Donald C. Attachment for portable drills. 3,698,827, Cl. 408-92.000.

Saltich, Jack L.: *See—*
Gurtler, Richard W.; and Saltich, Jack L., 3,699,407.

Salyer, Ival O.: *See—*
Tapp, James S.; Beemsterboer, George L.; and Salyer, Ival O., 3,698,560.

Salz, Karl; and Skrivanek, Ladislav, to World Patent Development Corporation. Application of copolymers of polyvinyl acetals as a means for protection, preservation, restoration stabilization hydrophobization of papyrus, papers, books and or manuscripts. 3698,925, Cl. 117-2.00r.

Salzmann, Ferdinand F., to Consolidated Foods Corporation. Traverse assembly for draperies and the like. 3,698,035, Cl. 16-95.00d.

Sampson, Ronald G., to Nalco Chemical Company. Compositions and processes for breaking petroleum emulsions. 3,699,051, Cl. 252-344.

San Antonio, Victorino T. Netmaking slide rule. 3,699,314, Cl. 235-78.000.

Sanderford, Freeman M.; and Ray, Jack C., to Kaiser Aluminum & Chemical Corporation. Surface modified alumina hydrate filler. 3,699,041, Cl. 252-8.100.

Sanders Associates, Inc.: *See—*
Parkin, William J., 3,699,345.
Stein, Bernard; and Davis, Sheridan, 3,699,343.
Tauscher, Kenneth E.; Roome, Theodore F., Jr.; and Coon, David S., 3,699,449.

Sanders, Lon L., to International Telephone and Telegraph Corporation. Instrument landing system using a retrodirective sletten antenna responser. 3,699,571, Cl. 343-6.50r.

Sanderson, John L.; and Swift, Edward W., to Shell Oil Company. Process for the oxidation of aryl alkyl sulfoxides to aryl alkyl sulfones. 3,699,171, Cl. 260-607.00a.

Sanderson, Robert A., to United Aircraft Corporation. Fuel cell system having a natural circulation boiler. 3,698,957, Cl. 136-86.00c.

Sandhage, Ellsworth: *See—*
Taylor, Arthur Sinclair; Sandhage, Ellsworth; Bott, George; and Konazewski, William, 3,698,450.

Sandox Ltd.: *See—*
Seemann, Fritz; and Troxler, Franz, 3,699,123.

Sandoz-Wander, Inc.: *See—*
Eberle, Marcel K.; and Houlihan, William J., 3,699,119.

Sanford, Lloyd C., to Itek Corporation. Sensitometer apparatus. 3,698,294, Cl. 95-1.000.

Santacroce, Alfred Michael: *See—*
Illig, Howard Clayton; Lehder, Wilfred Emile, Jr.; Parker, James Daniel, III; Santacroce, Alfred Michael; and Sheridan, James Arthur, 3,698,533.

Sanyo Electric Co., Ltd.: *See—*
Mashima, Fumio, 3,699,247.

Sasabe, Kaoru; and Oda, Fujio, to Matsushita Electric Industrial Co., Ltd. Motor speed controlling apparatus. 3,699,418, Cl. 318-325.000.

Sasaki, Shunroku: *See—*
Kiyasu, Zen'Iti; Kawashima, Masao; Sasaki, Shunroku; Mineshima, Yukihiko; and Kurita, Shyoichi, 3,699,567.

Sass, Allan S.: *See—*
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Satco Inc.: *See—*
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Sato, Hideo; and Ito, Kunihiko, to Tokyo Shibaura Electric Co., Ltd. Automatic dishwasher. 3,698,406, Cl. 134-57.00d.

Sato, Hiromitsu: *See—*
Morikawa, Kazumasa; Kobayashi, Makoto; Sato, Hiromitsu; and Nakazima, Jun, 3,698,652.

Sato, Shui: *See—*
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Sato, Shui; Sugita, Sadao; Nakajima, Tomio; and Kasai, Keiji, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color-photographic material. 3,698,907, Cl. 96-84.00r.

Sato, Takayoshi, to Kabushikikaisha Copal. Circuit for preventing false operation of an electronic camera shutter. 3,698,302, Cl. 95-10.0ct.

Saulgeot, Claude; and Coste, Jean-Noel, to Compagnie Industrielle des Telecommunications Cie. Spindle assembly air bearings. 3,698,774, Cl. 308-9.000.

Sauter, Walter A.: *See—*
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Sautter, Alton F.: *See—*
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Sauvage, Michel: *See—*
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Sawada, Kiyoshi: *See—*
Iimura, Kazuo; Sawada, Kiyoshi; and Kato, Hiroki, 3,698,817.

Sawyer, John M., to Goodyear Tire & Rubber Company, The. Foam structure with protective overcoat. 3,698,927, Cl. 117-33.300.

Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Radiation sensitive polymers. 3,699,080, Cl. 260-470.000.

Saytes, Adam Eric, to Siderugica Occidental C.A. Process for the production of steel structural shapes. 3,698,224, Cl. 72-178.000.

Scales, John Tracey; and Goddard, David, to National Research Development Corporation. Prosthetic acetabular devices. 3,698,017, Cl. 3-1.000.

Scarnato, Thomas J.; and Meyer, Martin H., to International Harvester Company. Crop harvesting machine. 3,698,162, Cl. 56-1.000.

Schaaf, Gunther; and Smith, Nathan R., to Ramsey Engineering Company. Probe construction. 3,699,503, Cl. 339-176.00p.

Schaffer, Harry G.; Neilson, Dan A.; and Poumakis, Eleuthere, to Singer Company, The. Multiprogramming control for a data handling system. 3,699,532, Cl. 340-172.500.

Scharfen, Hans; and Steinberger, Josef, to Forkardt, Paul, Kommanditgesellschaft. Power operated clamping device for machine tools. 3,698,729, Cl. 279-4.000.

Scheel, John R.: *See—*
Overmyer, Robert C.; and Scheel, John R., 3,698,137.

Scheibelhoffer, Anthony S., to Goodyear Tire & Rubber Company, The. Polyurethane reaction mixture based on anhydrous diamineketone curative. 3,699,063, Cl. 260-18.0tn.

Scheitel, Neal W., to Bus & Car Company S.A. Folding door for luggage compartment of vehicles such as motor-coaches for example. 3,698,464, Cl. 160-188.000.

Schenbeck, Robert E., to McDonnell Douglas Corporation. Multichannel autopilot with equalization means. 3,698,665, Cl. 244-77.00m.

Schenck, Carl, Maschinenfabrik GmbH: *See—*
Maus, Otfrid; Mueller, Martin; and Mueller, Robert, 3,698,828.

Schettler, Kurt, to Siemens Aktiengesellschaft. Device for sealing and lubricating reciprocating machine members. 3,698,726, Cl. 277-125.000.

Schimschek, Erhard J.; and Trias, John A., to United States of America, Navy. Method of preparation of rare earth (III) phosphorus dichloridates and phosphorus dibromidates. 3,699,211, Cl. 423-263.000.

Schindel, Arnold: *See—*
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Schindler, Hans R. Delta coder. 3,699,566, Cl. 340-347.0ad.

Schindler, Walter; Schmid, Erich; and Zust, Armin, to Geigy Chemical Corporation. 8-Chloro-10-(1-piperazinyl)-10,11-dihydro-dibenzo [b,f] thiepin as a central nervous depressant. 3,699,104, Cl. 260-268.

Schindler, Walter; Schmid, Erich; and Zust, Armin, to Geigy Chemical Corporation. 1-[2-or 3-]4-(10,11-Dihydro-dibenz-[b,f]-thiepin-10-yl-1 -piperazinyl[-alkyl] 3-alkyl-2-imidazolidinone derivatives. 3,699,107, Cl. 260-268.

Schlotterbeck, David L.; and Briar, John R., to General Motors Corporation. Electronic controller for automotive air conditioning system. 3,698,204, Cl. 62-206.000.

Schmid, Erich: *See—*
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Schmitt, Werner H.: *See—*
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Schmitt, William C., to Milwaukee Facicets, Inc. Non-rise valve for faucets or the like. 3,698,418, Cl. 137-315.000.

Schneider, Irving: *See—*
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Schneider, Joachim: *See—*
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Schole, Murry L.; and Gubner, Richard S. Dental preparations. 3,699,221, Cl. 424-54.000.
Scholl, Ronald F.; and Bleha, William P., Jr., to Hughes Aircraft Company. Light activated, high resolution, field sustained conductivity image storage and display device. 3,699,374, Cl. 313-94.000.
Schott, Emilio: *See—*
Meisels, Alex; and Schott, Emilio, 3,699,116.
Schott, Lawrence A. Motion transmitting mechanism. 3,698,255, Cl. 74-193.000.
Schrader, Clarence O.: *See—*
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Schrage, Albert; and Readio, Philip D., to Dart Industries Inc. Polyolefins modified with unsaturated glycidyl compounds and polyacrylate compounds. 3,699,186, Cl. 260-836.000.
Schreck, John Thomas, to AMP Incorporated. Electro formed electrical connector process. 3,698,083, Cl. 29-629.000.
Schreiber, Kurt, to Canadn Patents and Development Limited. Seed having a multiple layered coating and process for preparing same. 3,698,133, Cl. 47-57.600.
Schreyer, Gerd; Weiberg, Ottl; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of hydrogen peroxide. 3,699,217, Cl. 423-589.00n.
Schrier, Peter G.: *See—*
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Schubert, William L., to International Harvester Company. I.P.T.O. brake unit. 3,698,524, Cl. 192-18.00a.
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Schuh, Eduard: *See—*
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Schuler, Chester L., to Powercube Corporation. Modular circuit package with enhanced heat dissipation. 3,699,394, Cl. 317-100.000.
Schultz, Lewis K.: *See—*
Bell, Harry F.; Lazzarini, Donald J.; and Schultz, Lewis K., 3,699,029.
Schultz, Ronald B., to Addressograph-Multigraph Corporation. Photoelectrostatic members. 3,698,895, Cl. 96-1.800.
Schultz, Rudolf, to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntzi Gesellschaft mit beschrankter Haftung & Co. Device for attaching fishing reels to fishing tackles. 3,698,118, Cl. 43-22.000.
Schulze & Burgess Company: *See—*
Ellis, Walter S., 3,698,052.
Schurch, Eugen; and Storrer, Rolf, to Von Roll AG. Transport unit for overhead or suspended conveyor systems. 3,698,326, Cl. 105-156.000.
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Schwab, Johann; Buchel, Kurt; Eder, Otto; Hascic, Wladimir; and Marek, Ludwig, to SEMPERIT Aktiengesellschaft. Manufacture of articles of footwear. 3,698,027, Cl. 12-142.000.
Schwarzbeck, John G., to Western Gear Corporation. Torque controlled power roller for conveyor system. 3,698,539, Cl. 198-127.000.
Schwarzkopf, Anton, to Schwarzkopf, Anton, Firma. Merry-go-round. 3,698,710, Cl. 272-7.000.
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Scope Lock, Inc.: *See—*
Boots, Patrick R.; and Gaddis, Kenneth W., 3,698,135.
Scott, Floyd Logan, Jr.: *See—*
Litchfield, Mason Rawleigh; and Scott, Floyd Logan, Jr., 3,698,426.
Scott, Roderic M., to Perkin-Elmer Corporation, The. Pictorial systems, having high resolution imagery at all object distances. 3,699,245, Cl. 178-6.000.
Seamands, Robert E.: *See—*
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Sears, Hartley M.; and Schrader, Clarence O., to Frawley Enterprises, Inc. Arrangement for preventing leakage from ball-point pen cartridges. 3,698,825, Cl. 401-217.000.
Sears, Roebuck and Co.: *See—*
Collins, Edward C.; and Hittle, Eugene C., 3,698,780.
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Seemann, James M.: *See—*
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Seiferth, Oscar E.: *See—*
Gifford, Maurice J.; Seiferth, Oscar E.; and Grindrod, Paul E., 3,698,979.
Sejournet, Jacques; and Garin, Jose Ignacio Martinez, to Cefilac. Method of fabricating seamless steel pipes. 3,698,070, Cl. 29-527.600.
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Schwab, Johann; Buchel, Kurt; Eder, Otto; Hascic, Wladimir; and Marek, Ludwig, 3,698,027.
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Sloan, Albert Everett; and Turnbull, Alistair Gordon, 3,699,416.
Shadle, Paul W., to United States of America, Air Force. Method and system of surveillance processing. 3,699,577, Cl. 343-112.00r.
Shaffer, John W.; and McDonough, Thomas B., to Sylvania Electric Products, Inc. Fulminating material application technique. 3,699,021, Cl. 204-146.000.
Shaheen, Donald G.: *See—*
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Shahlin, Joseph M.; and Simone, John, to North American Rockwell Corporation. Method of providing intersitial conductors between plated memory wires. 3,698,081, Cl. 29-604.000.
Shambon, W. S., & Co.: *See—*
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Shavel, John, Jr.: *See—*
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Coyle, James, 3,699,175.
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Shepard, James N.: *See—*
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Sheridan, James Arthur: *See—*
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Cunningham, Arthur L., 3,699,064.
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Shiba, Kaoru. Method for converting sodium sulfide to sodium sulfite. 3,698,860, Cl. 23-129.000.
Shibatani, Takeji: *See—*
Chibata, Ichiro; Kakimoto, Toshio; Shibatani, Takeji; and Nishimura, Noriyuki, 3,698,999.
Shields, John T., to Marlan Company. Tear-off blade arrangement for laminating machine. 3,698,990, Cl. 156-522.000.
Shigematsu, Hiroji; Yamaguchi, Tomio; Fukue, Hisanobu; Ogawa, Hiroshi; Hashimoto, Takashi; Murakoshi, Kenichi; Suguri, Susumu; and Fujimura, Tsutomu, to Mitsubishi Jukogyo Kabushiki Kaisha and Japan Atomic Energy Research Institute. Remotely controllable dfect detector of electric resistance type. 3,699,436, Cl. 324-65.
Shiley, Donald P. Pivoted discoid heart valve having a changing pivot axis. 3,698,018, Cl. 3-1.000.
Shimada, Masaru: *See—*
Maruyama, Shoji; Saito, Tadashi; Yoshida, Shigeaki; and Shimada, Masaru, 3,699,000.
Shimoda, Keitaro; and Obama, Isamu, to American Cyanamid Company. Acrylic synthetic fibers having improved properties and process for producing the same. 3,698,994, Cl. 161-178.000.
Shinetsu Chemical Company: *See—*

Wada, Tadashi; Itoh, Kunio; Imai, Kiyoshi; and Inomata, Hiroshi, 3,699,073.
Shinoda, Daizaburo; and Ishikawa, Masaoki, to Nippon Electric Company, Limited. Gallium-arsenide Schottky barrier type semiconductor device. 3,699,408, Cl. 317-237.000.
Shinohara, Takeo; and Miyamoto, Yoshikazu, to Nippon Electric Company, Limited. Signal switching device. 3,699,295, Cl. 200-175.000.
Shinomiya, Yasuo: *See—*
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Shioyama, Osamu; Mine, Seizo; and Murata, Kikuzo, to Nihon Nohyaku Co., Ltd. Carbamoyl saccharin derivatives as fungicides. 3,699,228, Cl. 424-270.000.
Shira, Glenn L.; and Ruff, Joseph N., to United States of America, Navy. Adaptable pyrotechnic candle with disposable folding shield. 3,698,318, Cl. 102-37.800.
Shoemaker, James C., to Symons Corporation. Scaffold-supporting bracket for a concrete wall form. 3,698,680, Cl. 249-189.000.
Shore, Daniel B., to International Harvester Company. Automatic bucket positioning device. 3,698,583, Cl. 214-764.000.
Siai-Marchetti S.p.A.: *See—*
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Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, to Montecatini Edison S.p.A. Fluorinated oxygen-containing products and process for preparation thereof. 3,699,145, Cl. 260-463.000.
Sickles, James E., to Ransburg Electro-Coating Corporation. Spray charging device. 3,698,635, Cl. 239-3.000.
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Siebert, Alan R., to Goodrich, B. F., Company, The. Preparation of hydroxyl terminated polymers. 3,699,153, Cl. 260-484.00r.
Sieg, Robert P.: *See—*
Hughes, Thomas R.; and Sieg, Robert P., 3,699,035.
Siemens Aktiengesellschaft: *See—*
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Reuschel, Konrad; Platzoder, Karl; and Kursawe, Helga, 3,698,354.
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Sierk, Raymond H.; and Sierk, Raymond W., to Atomatic Swank Frank Corporation. Magazine for dispensing machine. 3,698,601, Cl. 221-105.000.
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Sigmatex AG: *See—*
Weman, Per Olaf, 3,698,048.
Sikes, John. Structural member construction for building walls. 3,698,147, Cl. 52-276.000.
Silver, Arthur E., to Power Designs, Inc. Multi-range regulated DC power supply. 3,699,352, Cl. 307-75.000.
Silvia, Everett R.: *See—*
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Simon, John M.: *See—*
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Simon, Ralph E.; and Williams, Brown F., to RCS Corporation. Negative Effective electron affinity emitters with drift fields using deep acceptor doping. 3,699,404, Cl. 317-235.00r.
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Simpson, Lee S. Gathering apparatus. 3,698,169, Cl. 56-328.000.
Sinclair, Gordon J., to Diebold, Incorporated. Vacuum head magnetic valve construction for pallet loader. 3,698,755, Cl. 294-65.000.
Singer Company, The: *See—*
Barber, Warren A., 3,699,399.
Cohen, Edwin; and Altmiller, John C., 3,699,244.
Cowdrey, Roy M.; and Current, Wayne A., 3,698,087.
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Hlipala, Edward; and Schindel, Arnold, 3,699,369.
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Siwko, Karol: *See—*
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Sjotun, Kyrre Guttorm. Oil burner system with motor driven pump controlling by-pass valve. 3,698,639, Cl. 239-124.000.
Skabunde, Steven Eldor, to Giddings & Lears, Inc. Hydrostatic seal for rotary machine tool spindles. 3,698,725, Cl. 277-74.000.
Skeggs, Leonard T. Technicon Instruments Corporation Method and apparatus for sample analysis on a continuous flow basis. 3,699,004, Cl. 195-103.50r.
Skei, Inge. Recording apparatus for sonar and echo sounding systems. 3,698,658, Cl. 242-192.000.
Skobel, Max, to Dow Corning Corporation. Equipment for making reinforced tubing. 3,698,988, Cl. 156-428.000.
Skrivanek, Ladislav: *See—*
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Slaski, Joseph A.: *See—*
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SLI Industries: *See—*
Cox, Robert M., 3,698,437.
Sloan, Albert Everett; and Turnbull, Alistair Gordon, to Sevaon Engineering Limited. Dynamic braking of wound motor polyphase induction motors. 3,699,416, Cl. 318-211.000.
Smaller, Philip. Double transfer tape copy system. 3,699,269, Cl. 179-100.20e.
Smeets, Fred, to N. V. La Citrique Belge. Unsaturated carboxylic salt materials and derivatives thereof. 3,699,059, Cl. 252-557.000.
Smith, Anthony, to Hoover Company, The. Gas fired forced convection ovens. 3,698,377, Cl. 126-21.00a.
Smith, Bernard; and DePietro, Anthony J. Safety bottle top. 3,698,585, Cl. 215-9.000.
Smith, Calvin S.; and McLeod, William J., to Chevron Research Company. Hydrogen manufacture. 3,699,218, Cl. 423-648.000.
Smith, Dallas F., to General Electric Company. Apparatus for inserting coil side turn portions and insulators into the slots of a magnetic core. 3,698,063, Cl. 29-205.00r.
Smith, Henry, to British Steel Corporation. Lifting tongs. 3,698,757, Cl. 294-119.000.
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Gold, Harold E.; and Smith, Ralph B., 3,698,472.
Smith, Raymond Peter, Jr. Short circuit locator apparatus including a plurality of intermittently operated circuit breakers. 3,699,433, Cl. 324-52.000.
Smith, Russell G.: *See—*
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Smith, Sidney Z.: *See—*
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Smith, Thomas Basil, III: *See—*
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Smith, Thomas R., to Pyramid, Inc. Document holder. 3,698,111, Cl. 40-10.00r.
Smith, Vern; Fallon, Merton R.; and Johnston, Mack S., to Republic Corporation. Keg tapping device with automatic gas shutoff valve. 3,698,417, Cl. 137-212.000.
Smith, William E.: *See—*
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Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A.: *See—* Vuaille, Andre, 3,698,369.
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Trasler, Paul Vincent Marie Brigstock, 3,699,460.
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Sony Corporation: *See—*
Morio, Minoru; and Kimura, Hiroyuki, 3,699,240.
Soong, Pinnan. Preparation of bromelain from the pineapple stems. 3,699,001, Cl. 195-66.00r.
Sorenson, Judson Olbert, to Asco, Inc. Apparatus for making a display button. 3,698,065, Cl. 29-238.000.

Sorkin, Howard; and Klein, Richard Ira, to RCA Corporation. Fabrication of liquid crystal devices. 3,698,449, Cl. 141-1.000.

Southworth, Donovan A.: *See—*
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Spaderna, Conan H. Universal electric connector. 3,699,499, Cl. 339-91.00r.

Spain, Robert J., to Compagnie Internationale fur l'Informatique. Binary coded information stores. 3,699,550, Cl. 340-174.0tw.

Sparlin, Derry D., to Continental Oil Company. Promotion of burning of oil slicks with particulate, foamed alkali metal silicates. 3,698,850, Cl. 431-8.000.

Spence, John R., to North American Rockwell Corporation. Bootstrapped inverter memory cell. 3,699,539, Cl. 340-173.00r.

Spencer, Francis T., to West Point-Pepperell, Inc. Grid for producing an electrostatic field. 3,698,357, Cl. 118-636.

Sperry, Philip R.: *See—*
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Spicer, Lauren D. Perpetual calendar. 3,698,113, Cl. 40-113.000.

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Spuhl, Walter, to Spuhl AG. Apparatus for fastening the end coils of border springs of a spring construction to an elongate wire. 3,698,448, Cl. 140-3.0ca.

Square D Company: *See—*
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Squillari, Walter: *See—*
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Stacey, Frank Donald; Rynn, John Munro William; and Little, Eric Cooper, to University of Queensland, The. Tilt meter. 3,698,094, Cl. 33-366.000.

Stacey, Joseph Gilbert: *See—*
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Stahl, Lawrence E.; and Gropper, Lee, to Beckman Instruments, Inc. Detecting excessive centrifuge rotor oscillations. 3,699,287, Cl. 200-61.45r.

Staley, A. E., Manufacturing Company: *See—*
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Standard Oil Company (Indiana): *See—*
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Stanford, Robert M. Drive and steering mechanism for tractors. 3,698,498, Cl. 180-6.200.

Stark, Sven Olof Soren, to Cordotex SA., mesne. Packaging containers of parallelepiped shape. 3,698,624, Cl. 229-23.00r.

Starr, Leon; and Runyon, David Jon, to Celanese Corporation. Stabilized oxymethylene polymers. 3,699,062, Cl. 260-18.00n.

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Staut, Ronald; and Judd, George G., to General Refractories Company. Dolomitic refractory. 3,698,922, Cl. 106-58.000.

Steadman, Rufus F. Drill bit sharpening mechanism for use in conjunction with hand drills. 3,698,140, Cl. 51-241.00g.

Steels, Gordon, to Baker Perkins Limited. Dough laminating. 3,698,309, Cl. 99-450.100.

Stein, Bernard; and Davis, Sheridan, to Sanders Associates, Inc. Condensation heated black body radiation source. 3,699,343, Cl. 250-85.000.

Steinberger, Josef: *See—*
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Steingroever, Erich, to Elektro-Physik Hans Nix & Dr. Ing. Steingruever, KG. Magnet for use in magnetic thickness gauges. 3,699,487, Cl. 335-302.000.

Steitz, Alfred, Jr., to Standard Oil Company, The (Indiana). Purification of phenylindane carboxylic acids by permanganate treatment of the sodium salts. 3,699,160, Cl. 260-525.000.

Stempler, Samuel; and Tellerman, Jacob, to Kollsman Instrument Corporation. Tape position sensor, optical. 3,699,421, Cl. 318-640.000.

Stenzel, Donald W.: *See—*
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Steppe, Kenneth E.; and Webre, Alfred L., Jr., to Owens-Illinois, Inc. Apparatus for removing rock from unscreened sugar cane juice. 3,698,949, Cl. 127-9.000.

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Stetson, Harold Wilbur; and Gyurk, Warren Joseph, to Western Electric Copmany, Incorporated. Alumina substrates. 3,698,923, Cl. 106-62.000.

Stevens, J. P., & Co., Inc.: *See—*
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Stevens, John Joseph, Jr.: *See—*
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Stevens, John N., to Catug Corporation. Seagoing tug and barge construction. 3,698,349, Cl. 114-235.00r.

Stevens, Walter R. Automatic control of headlights, taillights, and warning flasher lights. 3,699,514, Cl. 340-60.000.

Stewart, Albert A. Golf practice device. 3,698,721, Cl. 273-186.00c.

Stockman, Charles H., to Goodrich, B. F., Company, The. Acrylic terpolymer resins plasticized with silicone oils. 3,699,067, Cl. 260-29.1sb.

Stoeckli, Oscar W.: *See—*
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Stoelting, Carl R., to Stoelting Brothers Company. Consistency control for slush freezer. 3,698,203, Cl. 62-136.000.

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Stone, Julian, to Bell Telephone Laboratories, Incorporated. Error reduction in communication systems. 3,699,463, Cl. 329-145.000.

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Storz, Frederick G.: *See—*
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Stratton, Patrick Joseph. Post anchor. 3,698,144, Cl. 52-99.000.

Straub, Paul J., to Mallory, P. R., & Co., Inc. Timer with internal stop mechanism comprising annular ring structure interfitting complementary housing members. 3,699,277, Cl. 200-38.00r.

Straub, Richard K., to Farbenfabriken Bayer Aktiengesellschaft. Cutting torch tip guide. 3,698,701, Cl. 266-23.00m.

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Stromberg, Carl E.; and Reynolds, John, to Stauffer Chemical Company. Process of inhibiting corrosion in spent sulfuric acid sludge systems. 3,698,858, Cl. 21-2.500.

Stromberg-Carlson Corporation: *See—*
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Stubbmann, Albert, to Kohner Bros., Inc. Escapement mechanism. 3,698,252, Cl. 74-1.500.

Stuber, Fred A.: *See—*

Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, 3,699,080.

Studenick, David K.; Tyler, Allen L.; and Squillari, Walter, to United States of America, National Aeronautics and Space Administration. System for stabilizing torque between a balloon and gondola. 3,698,667, Cl. 244-32.000.

Sturm, Hans Juergen: *See—*
Armbrust, Herbert; Sturm, Hans Juergen; Engelbach, Heinz; Wistuba, Hermann; Stoessel, Armin; and Krabetz, Richard, 3,699,134.

Subsea Equipment Associates Limited, mesne: *See—*
Dobler, Christian D.; and Lilly, Herbert J., Jr., 3,698,433.
Morgan, George W., 3,698,348.

Sudduth, William B., to Flex Key Corporation. Keyboard, digital coding, switch for digital logic, and low power detector switches. 3,699,294, Cl. 200-166.00c.

Sugi, Tatsuo: *See—*
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Sugita, Sadao: *See—*
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Suguri, Susumu: *See—*
Shigematsu, Hiroji; Yamaguchi, Tomio; Fukue, Hisanobu; Ogawa, Hiroshi; Hashimoto, Takashi; Murakoshi, Kenichi; Suguri, Susumu; and Fujimura, Tsutomu, 3,699,436.

Sulich, Janusz S., to Bendix Corporation, The. Fluidic fluidmetering system. 3,698,413, Cl. 137-81.500.

Sulzer Brothers Limited: *See—*
Feiss, Rene T., 3,698,067.

Sumitomo Bakelite Company Limited: *See—*
Oshima, Keiji; Yamada, Shozo; Sakurai, Fujio; Iwasa, Yoshisuke; Horiuchi, Koichi; Uchida, Unosuke; Nomura, Teruhiko; and Tominaga, Yasushi, 3,699,203.

Sumitomo Chemical Company, Limited: *See—*
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Summer, Dale E.: *See—*
Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., 3,698,337.

Summit Engineering Corporation: *See—*
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Rhodes, Charles F., Jr., 3,698,237.

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Superior Electric Company, The: *See—*
Henderson, Paul D., 3,698,826.

Supla Etablissement: *See—*
Uhrig, wilhelm, 3,698,064.

Susewitz, Michael Bernard. Fragrance emitting article for artificial Christmas trees. 3,698,991, Cl. 161-14.

Susquehanna Corporation, The: *See—*
Wallace, Jacob L., Jr., 3,699,255.

Susuki, Rinnosuke; and Hoshi, Hiroshi, to Raion Yushi Kabushiki Kaisha. Method and apparatus for manufacture of corrugated synthetic resin board. 3,698,977, Cl. 156-210.000.

Sutton, John Anthony, to Courtaulds Limited. Garment dyeing process. 3,698,855, Cl. 8-150.000.

Sutton, Thomas J., to Oakland Community College. Portable study carrel. 3,698,104, Cl. 35-60.000.

Suzui, Masaaki: *See—*
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Suzuki, Akio: *See—*
Miyata, Akira; Tomita, Chikayoshi; Suzuki, Akio; Okubo, Hideyo; and Nagakumi, Masahiko, 3,699,012.
Miyato, Akira; Ohkubo, Hideyo; Tomita, Chikayoshi; and Suzuki, Akio, 3,699,013.

Suzuki, Masaru; and Kawai, Yoshihiro, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Directional signaling mechanism for automotive vehicle. 3,699,286, Cl. 200-61.340.

Suzuki, Syoichi, to Nippon Gakki Seizo Kabushiki Kaisha. Iremolo arrangement for an electronic musical instrument employing feedback of modulated signal to modulator input. 3,699,233, Cl. 84-1.220.

Suzuki, Yoshitaka; Takenoue, Atsushi; and Kojima, Hideo. Chlorination process. 3,699,178, Cl. 260-659.00a.

SW Industries, Inc.: *See—*
Hess, Ralph A.; and McNamee, James P., 3,698,053.

Sweeney, William A., to Chevron Research Company. Color reduction of olefin sulfonates. 3,699,157, Cl. 260-513.00r.

Sweet, Ervin J.; Doyle, Brian W.; and Rygelis, Joseph, to Avco Corporation. Combustion liner joint. 3,698,743, Cl. 285-41.000.

Swett, James B.: *See—*
Ashton, Harold P.; and Swett, James B., 3,698,460.

Swett, James B.; and Smith, Sidney Z., to Dart Industries, Inc. Storage container for celery or the like. 3,698,783, Cl. 312-351.000.

Swichard, Edward A.: *See—*
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Swift, Edward W.: *See—*
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Swoveland, Jackie E.; Irvin, Lothair; and Charles, James A., to Dana Corporation. Speed responsive switch. 3,699,288, Cl. 200-80.00r.

Sylvania Electric Products Inc.: *See—*
Anton, Franke, 3,699,382.
Dyche, James W., 3,699,517.
Paget, Fredrick W., 3,699,385.
Shaffer, John W.; and McDonough, Thomas B., 3,699,021.

Symons Corporation: *See—*
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Syrop, Leroy J., to Del Mar Engineering Laboratories. Process for recrystallizing hexanitrostilbene. 3,699,176, Cl. 260-645.000.

Szasz, Imre, to Graco Inc. Device for the electrostatic application of protective coatings with synthetic powders by the use of spray guns. 3,698,636, Cl. 239-15.000.

Szymanski, Leonard W.; and Slaski, Joseph A., to Lift Parts Mfg., Inc. Extendable self-aligning trailer hitch. 3,698,739, Cl. 280-478.00b.

Taczak, William J., Jr., to United States of America, Navy. Two-color radiometer. 3,699,339, Cl. 250-83.30h.

Tafel, Leonard I., to North American Rockwell Corporation. Means for oscillating and silencing a ductor roller in a printing press. 3,698,313, Cl. 101-350.000.

Taits, Samuil Zalmanovich: *See—*
Mikhailov, Nikolai Petrovich; Rapoport, Lev Moiseevich; and Taits, Samuil Zalmanovich, 3,698,235.

Tak, Charles S.: *See—*
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Takasaka, Masahiro: *See—*
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Takase, Shinji; and Shiori, Tomonori, to Nippon Oil Company Limited. Method of halogenating crystalline aluminosilicate. 3,699,056, Cl. 252-442.000.

Takatoshi, Shimomura, to Sumitomo Chemical Company, Limited. Method for preparing block copolymer. 3,699,190, Cl. 260-877.000.

Takeda Chemical Industries, Ltd.: *See—*
Wada, Takeo; Okada, Kazuo; and Ohyama, Masaru, 3,698,358.

Takegawa, Akio: *See—*
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Tanaka, Katsunobu; Ohshima, Kazuo; Tokoro, Yoh; and Okii, Mitsuyoshi, to Kyowa Hakko Kogyo Kabushiki Kaisha. Preparation of L-tyrosine by fermentation. 3,698,997, Cl. 195-28.00r.

Tanaka, Masao; Kishi, Teruo; and Mineura, Kazuyuki, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for preparing pyridoxine-cyclic-phosphate. 3,699,113, Cl. 260-297.00v.

Tapp, James S.; Beemsterboer, George L.; and Salyer, Ival O., to United States of America, Health, Education and Welfare, mesne. Hollow, fiber, artificial kidney with disposable dialyzing cartridge. 3,698,560, Cl. 210-321.000.

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Ashley, Eugene; Tassie, Douglas P.; and Seemann, James M., 3,698,283.

Tate & Lyle Limited: *See—*
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Tatum, Harold E.: *See—*
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Tauscher, Kenneth E.; Roome, Theodore F., Jr.; and Coon, David S., to Sanders Associates, Inc. Time domain modulator for spectrum shaping of pulsed waveforms. 3,699,449, Cl. 325-324.000.

Taylor, Arthur Sinclair; Sandhage, Ellsworth; Bott, George; and Konazewski, William, to American Cyanamid Company. Sterile container filling mechanism. 3,698,450, Cl. 141-85.000.

Taylor, Brian Leslie: *See—*
Causer, Roy; Farren, John; Jones, Terence Leslie; Taylor, Brian Leslie; and Webster, Ronald Kerry, 3,698,819.

Taylor, Glenn L.; Cotton, John W.; and Winkler, De Loss E., to Shell Oil Company. Blend of block copolymer, one of which is epoxidized. 3,699,184, Cl. 260-836.000.
Taylor, Lloyd D.: *See—*
Grasshoff, J. Michael; and Taylor, Lloyd D., 3,698,898.
Taylor, Paul H. Fluid amplified liquid spring shocks and/or shock absorbers. 3,698,521, Cl. 188-306.000.
Tebble, Robert S.: *See—*
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Technical, Inc.: *See—*
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Tellerman, Jacob, to Kollsman Instrument Corporation. Solid state display. 3,698,793, Cl. 350-160.00r.
Tempcraft Tool & Mold, Inc.: *See—*
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Temptat Corporation: *See—*
Martin, John E.; and Landry, B. Roger, 3,698,483.
Tenkumo, Shohei, to Minolta Camera Kabushiki Kaisha. Shutter release control mechanism. 3,698,304, Cl. 95-53.0eb.
Tenneco Oil Company: *See—*
Rowley, Kermit G., 3,698,474.
Termin, Erich; and Bleh, Otto, to Dynamit Nobel Aktiengesellschaft. Production of potassium titanyl oxalate. 3,699,137, Cl. 260-429.500.
Terner, E. M., to Midland Glass Company, Inc. Plastic encased glass container. 3,698,586, Cl. 215-12.00r.
Terrox Iron Ltd.: *See—*
Nye, John David, 3,698,647.
Tessler, Martin Melvyn; and Rutenberg, Morton Wolf, to National Starch and Chemical Corporation. Process for reacting ungelatinized starch with a mixed carbonic-carboxylic anhydride of a polycarboxylic acid. 3,699,095, Cl. 260-233.500.
Testa, Emilio: *See—*
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Texas Instruments, Incorporated: *See—*
Dyer, Lawrence Dean, 3,698,944.
Hall, Lou H., 3,698,071.
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Theriault, George R. Flashing. 3,698,142, Cl. 52-58.000.
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Mc Cullough, Edward E., 3,698,642.
Thompson, Grant; and Wall, Bobby M., 3,698,967.
Wall, Richard H., 3,698,321.
Thomas, Herbert, to Copystatics Manufacturing Corporation. Exposure lamp alignment equipment. 3,698,815, Cl. 356-121.000.
Thomas, Stephen E. Mechanism for obtaining energy from tire flexure. 3,699,367, Cl. 310-69.000.
Thompson, Donald O.: *See—*
Thompson, Robert B.; Thompson, Donald O.; Kraut, Edgar A.; and Lim, Teong C., 3,699,481.
Thompson, Earl Clayton. Water dispenser for animals. 3,698,431, Cl. 137-604.000.
Thompson, Grant; and Wall, Bobby M., to Thiokol Chemical Corporation. Method of curing propellents containing carboxyl terminated polyalkadienes using an organic iron salt. 3,698,967, Cl. 149-19.000.
Thompson, James E.; and D'Amato, Gerald J., to Motorola, Inc. Weighted ladder technique. 3,699,568, Cl. 340-347.0da.
Thompson, James W.: *See—*
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Thompson, John T.: *See—*
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Thompson, Joseph: *See—*
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Thompson, Raymond; and Guest, Ashley W., to Plessey Company Limited, The. Differential phase shift keying modulation system. 3,699,479, Cl. 332-16.00r.
Thompson, Robert B.; Thompson, Donald O.; Kraut, Edgar A.; and Lim, Teong C., to North American Rockwell Corporation. Low velocity highly anisotropic elastic materials. 3,699,481, Cl. 333-30.00r.
Thompson, Vernon R.: *See—*
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Thomsen, William F.; and Von Bramer, Paul T., to Eastman Kodak Company. Colored cyanoacrylate adhesive compositions. 3,699,076, Cl. 260-41.00c.
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Thunberg, Jon C.; and Philbrook, James E., to Grace, W. R., & Co. Process for the manufacture of ferrocyanide compounds. 3,699,214, Cl. 423-367.000.
Tietjen, James Joseph; Williams, Brown F.; and Wang, Chin Chun, to RCA Corporation. Photoemissive electron tube comprising a thin film transmissive semiconductor photocathode structure. 3,699,401, Cl. 317-234.00r.
Tilby, Sydney E., to Canadian Cane Equipment Ltd. Method and apparatus for preparing sugarcane stalks for subsequent processing. 3,698,459, Cl. 146-119.000.
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Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
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Toering, Robert J.; and Seamands, Robert E., to United States of America, Army. Buffer system for decelerating a reciprocating gun. 3,698,284, Cl. 89-43.00r.
Tokai Cold Forming Co., Ltd.: *See—*
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Tokarz, Richard D.; and Kaveckis, Joseph E., to United States of America, Atomic Energy Commission. High-resistance electrical conductor encapsulation. 3,699,200, Cl. 264-102.000.
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Tokyo Seimitsu Co., Ltd.: *See—*
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Tomozawa, Atsushi, to Nippon Electric Company, Limited. Frame synchronizing circuit for high clock frequency digital communication. 3,699,261, Cl. 179-15.0bs.
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Torley, Robert Edward; and Bankert, Richard Dale, to American Cyanamid Company. Non-woven fabrics by electrodeposition. 3,699,028, Cl. 204-180.00r.
Torok, Gabor Peter, to Bell Telephone Laboratories, Incorporated. Video processing circuit for producing a composite television signal including blanking and synchronization signals. 3,699,258, Cl. 178-7.200.
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Townsend, Eric Jean; and Fortin, Marcel, to Commissariat a l'Energie Atomique. Glove mounting ring device to permit of performing operations in a sealed container. 3,698,778, Cl. 312-1.000.
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Trembley, William H., to Vsi Corporation. Nut member. 3,698,278, Cl. 85-70.000.
Trepka, William J., to Phillips Petroleum Company. Triarylphosphine, Alkyllithium, and 1, 3-dihalobenzene polymerization initiator for conjugated diene polymerization. 3,699,055, Cl. 252-431.00p.
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Tucker, Robert V. Tobacco ash receiver. 3,698,401, Cl. 131-235.00r.
Tura, Natale G. Devices for piercing tubes in closed pressure systems. 3,698,419, Cl. 137-318.000.
Turbanti, Luigi. Tropyl ester of 2-phenyl-cyclohexen-3-carboxylate. 3,699,109, Cl. 260-292.000.
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Twine, Kenneth Frederick C., to International Computers Limited. Web feeding apparatus. 3,698,611, Cl. 226-50.000.
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Uchiyama, Yasuui Japan, to Nippon Gakki Seizo Kabushik Kaisha. Single ended push-pull amplifier. 3,699,466, Cl. 330-15.000.
Ueda, Hiromi: *See—*
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Uhrig, wilhelm, to Supla Etablissement. Method for drawing sliding clasps and fixing stop members onto engaged sliding-clasp fastener tapes. 3,698,064, Cl. 29-408.000.
Ukai, Takeshi, to Kabushiki Kaisha Ricoh. Apparatus for electrostatic charging of paper in electrophotographic reproduction. 3,699,388, Cl. 317-4.000.
Ulrich, Henri: *See—*
Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, 3,699,080.
UMC Electronics Company: *See—*
Weaver, Preston R., 3,698,249.
Umezu, Shiro; Hashimura, Tetsuo; and Sekido, Akira, to Tokyo Shibaura Electric Co., Ltd. High frequency heating apparatus. 3,699,299, Cl. 219-10.550.
Umio, Suminori; and Maeno, Shizuo, to Fujisawa Pharmaceutical Co., Ltd. 1,2,3-Trisubstituted pyrrolidine derivatives. 3,699,125, Cl. 260-326.810.
Underkoffler, Victor S.; and White, Richard B., to Leed & Northrup Company. Incremental slope method for optimum continuous digital linearization. 3,699,318, Cl. 235-151.100.
Union Carbide Corporation: *See—*
Perry, James L., 3,698,589.
Wynstra, John; and Stevens, John Joseph, Jr., 3,699,070.
Union Oil Company of California: *See—*
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National Aeronautics and Space Administration; Acting Administrator; with respect to an invention of:
Brown, Harry H. Reaction tester. 3,698,385, Cl. 128-2.00n.
Hunt, James G.; and Rice, Roy W. Extrusion can. 3,698,848, Cl. 425-176.000.
Navy: *See—*
Albatys, Zigmund M., 3,698,282.
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Upton, Douglas J. Fluid dispensing monitor. 3,699,315, Cl. 235-92.0fe.
Ur, Amiram. Blood coagulation detection method and apparatus. 3,699,437, Cl. 324-65.00r.
U.S. Divers Company: *See—*
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Moretti, Peter A., 3,699,192.
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Sainte-Beuve, Philippe, 3,699,446.
Van Essen, Hendrik Arie, 3,699,538.
Usami, Hikoo, to Tomy Kogyo Co., Ltd. Amusement device. 3,698,130, Cl. 46-206.000.
Ustin, Martin D., to Buchanan Electrical Products Corporation. Electrical limit switch. 3,699,283, Cl. 200-47.000.
Vaalburg, Teunis: *See—*
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Van Artsdalen, Earl F.: *See—*
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Van Der Veen, Romke: *See—*
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Van Dorn, Warren Guy; and Hardenbrook, James Maurice, to Staley, A. E., Manufacturing Company. Decorating anodized metal with dye imbition transferred images. 3,698,905, Cl. 96-48.00r.
Van Essen, Hendrik Arie, to U.S. Philips Corporation. Logical circuit. 3,699,538, Cl. 340-173.00r.
Van Gasselt, Max L. G.; Van Rijs, Pieter A.; and Basting, Willem J., to N.V. Neratoom. Mixing device for mixing two media with greatly different temperatures. 3,698,430, Cl. 137-604.000.
van Hoek, Cornelis: *See—*
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Van Mullekom, Hubert Peter, to N.V. Machinefabriek L te Strake. Device for forming a selvage. 3,698,441, Cl. 139-54.000.
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Van Swearingen, Earl C. Method for more brillant color picture presentation. 3,698,295, Cl. 95-1.
Van Sweringen, James P.: *See—*
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Van Uitert, Le Grand G.: *See—*
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Vasek, Anthony G., to Bendix Corporation, The. Pressure responsive transducer. 3,698,248, Cl. 73-398.0ar.
V.C.A. Corporation: *See—*
Miller, Christian F., 3,698,584.
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Velten, Terrance J., to Grace, W. R., & Co. Process for preparing a copper chromite calyst. 3,698,859, Cl. 23-56.000.
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Verbestel, Jean-Baptiste. Manufacture of pressed boards. 3,699,202, Cl. 264-109.000.
Vernitron Corporation, mesne: *See—*
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Vigo, Tyron L.; Margavio, Matthew F.; and Welch, Clark M., to United States of America, Agriculture. Fibrous crosslinked (aminoalkyl)aminochlorodeoxycellulose and method of preparation. 3,698,857, Cl. 8-116.200.
Vinson Industries, Inc.: *See—*
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Vits Maschinenbau GmbH: *See—*
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Vlasov, Viktor Griogroievich; Berezentsev, Jury Sergeevich; Mukhin, Vladimir Vanovich; and Kravchenko, Zhorzh Yakovlevich, to Novosibirsky Institut Inzhenerov Vodnogo Transporta. Apparatus for automatically controlling the movement of a dredger along a preetermined path for performing a dredging operation at a navigable area of a waterway. 3,699,572, Cl. 343-7.0ed.
Vogel, Calvin: *See—*
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Vogt, Gerd; and Poeste, Hans-Peter, to Mannesmann Aktiengesellschaft. Method for continuous casting of steel. 3,698,466, Cl. 164-55.000.

Vogt, John W.; and Schrier, Peter G., to Kewanee Oil Company. Topical dressing. 3,698,392, Cl. 128-268.000.

Vogt, Norman H. Electrical weight indicating device. 3,698,495, Cl. 177-211.000.

Von Bramer, Paul T.: *See—*
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Von Roll AG: *See—*
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Von Strandtmann, Maximilian; Klutchko, Sylvester; and Shavel, John, Jr., to Warner-Lambert Company. 3-Methylsulfinyl and 3-methylsulfonyl-4-chromanones. 3,699,128, Cl. 260-345.200.

Von Strandtmann, Maximilian; Klutchko, Sylvester; and Shavel, John, Jr., to Warner-Lambert Company. 3-(Methylthio) chromone and S-oxide derivatives. 3,699,129, Cl. 260-345.200.

Voorhees, Theodore. Machine for laminating surface textured film on strip molding. 3,698,989, Cl. 156-479.000.

Vossos, Peter H.: *See—*
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Vrabeli, Edward A.; and Cuzzone, Raymond, to General Electric Company. Fuse having vibration damping means for protecting the fuse link thereof. 3,699,491, Cl. 337-246.000.

Vsi Corporation: *See—*
Trembley, William H., 3,698,278.

Vuaille, Andre, to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A. Regulating devices for the flow of fuel in internal combustion engines. 3,698,369, Cl. 123-140.00r.

Vyzkumny Ustav Bavinarsky: *See—*
Boucek, Miroslav; and Jiskra, Miroslav, 3,698,174.
Dykast, Jaroslav, 3,698,175.

Wada, Ryuzi; Nakamura, Keiichi; and Kanou, Kimio, to Toyoda Koki Kabushiki Kaisha. Grinding machine with adaptive control system. 3,698,138, Cl. 51-165.800.

Wada, Tadashi; Itoh, Kunio; Imai, Kiyoshi; and Inomata, Hiroshi, to Shinetsu Chemical Company. Room temperature curable organopolysiloxane compositions. 3,699,073, Cl. 260-37.0sb.

Wada, Takeo; Okada, Kazuo; and Ohyama, Masaru, to Takeda Chemical Industries, Ltd. Method for maintaining freshness of aquatic animals. 3,698,358, Cl. 119-2.000.

Waddell, James M.: *See—*
Iskiyan, James L.; Waddell, James M.; and Way, Donald L., 3,699,526.

Wagner, Jacob C. Concrete finishing apparatus. 3,698,293, Cl. 94-50.00v.

Wagner, Jacob C. Ice-breaking system for ships. 3,698,340, Cl. 114-40.000.

Wagner, Jacob C. Ice-breaking hammer attachment for ships. 3,698,341, Cl. 114-40.000.

Wahlstrom, Sven E., to Shell Oil Company. Single-rail MOSFET memory with capacitive storage. 3,699,537, Cl. 340-173.00r.

Waite, Amory H., Jr.: *See—*
Golay, Marcel J. E.; and Waite, Amory H., Jr., 3,698,339.

Wakamatsu, Katsuhiko. Container having quantitative measuring chamber for granular material or the like. 3,698,606, Cl. 222-454.000.

Walchle, David L.; Smith, Russell G.; and Geraci, James L., to Xomox Corporation. Drape for operating microscope. 3,698,791, Cl. 350-61.000.

Walde, Robert A.: *See—*
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Walker, James V., to McDonnell Douglas Corporation. Fluid sealing device. 3,698,728, Cl. 277-165.000.

Walker, Richard M. Orthodontal toothpick. 3,698,405, Cl. 132-84.000.

Wall, Bobby M.: *See—*
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Wall, Reginald Victor; and Page, Harold Rodney Sven, to Plessey Handel und Investments A.G. Fluid testing apparatus. 3,698,238, Cl. 73-53.000.

Wall, Richard H., to Thiokol Chemical Corporation. Rocket assisted projectile. 3,698,321, Cl. 102-49.300.

Wallace, David J.: *See—*
Weaver, Max A.; and Wallace, David J., 3,699,092.

Wallace, Jacob L., Jr., to Susquehanna Corporation, The. Method and apparatus for measuring speed-error in a pulse train. 3,699,255, Cl. 178-69.00m.

Wallace, Robert J. Street curbings made of synthetic resins. 3,698,290, Cl. 94-31.000.

Waller, John J.: *See—*
Huibers, Derk Th. A.; and Waller, John J., 3,699,147.

Walsh, William L.: *See—*
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Walter, Heinz E.: *See—*
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Wang, Chin Chun: *See—*
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Wang, Ting I.; and Nakaguchi, Glenn M., to Atlantic Richfield Company. Process for producing vinyl glycidyl ether from low boiling alkyl vinyl ethers. 3,699,131, Cl. 260-348.00r.

Warburton, Donald L.: *See—*
Arbesman, Paul H.; James, Stanley D.; and Warburton, Donald L., 3,698,960.

Ward, Dennis J., to Universal Oil Products Company. HF removal system. 3,699,209, Cl. 423-240.000.

Ward, Frederick Edmund, to Miles Laboratories, Inc. 6,7 Benzo-2-(4 phenyl-1-piper-azinyl) phenyl-1-piperazinyl) [3.3.1] nonan-9-one. 3,699,106, Cl. 260-268.0tr.

Ward, John Wesley: *See—*
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Warner & Swasey Company, The, mesne: *See—*
Everett, Cecil D., 3,698,139.

Warner, Clifford George; and Kade, James Henry, to RCA Corporation. Reversible fixture for positioning magnetic memory cores. 3,698,057, Cl. 29-203.0mm.

Warner-Lambert Company: *See—*
Babson, Arthur L., 3,698,561
Kronish, Donald P.; and Zuriff, Lee S., 3,699,003.
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Wasson, John H.; Sherry, John S.; and Kayser, John P., to Airco, Inc. Hospital overhead service module. 3,699,235, Cl. 174-48.000.

Watanuki, Toshio, to Midori-Kai Co., Ltd, The, mesne. Camera for taking hemispherical motion picture. 3,698,803, Cl. 352-69.000.

Water Saver Faucet Co.: *See—*
Kersten, Samuel D., Jr.; Sautter, Alton F.; and Simon, John M., 3,698,421.

Waters Mfg. Co., Inc.: *See—*
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Watson, George A., to North American Rockwell Corporation. Circuit for sampng high speed data. 3,699,459, Cl. 328-151.000.

Watts, Chester B., Jr. Slotted cable glide slope antenna. 3,699,582, Cl. 343-737.000.

Watts, Lewis William; and Moss, Philip H., to Jefferson Chemical Company, Inc. Preparation of halogenated aromatic compounds. 3,699,177, Cl. 260-649.00d.

Waxlax, Chester E., to Horix Manufacturing Company. Bottle filling device. 3,698,452, Cl. 141-286.000.

Way, Donald L.: *See—*
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Waywell, David R.; and West, Charles T., to Standard Oil Company. Isomerization of dihydronaphthalenes. 3,699,180, Cl. 260-668.00f.

Weatherhead Company, The: *See—*
Keady, Frederick D., 3,698,771.
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Weaver, Max A.; and Wallace, David J., to Eastman Kodak Company. Thiazolyl-monoazo-tetrahydroquinoline dyes. 3,699,092, Cl. 260-155.000.

Weaver, Preston R., to UMC Electronics Company. Fluid pressure monitoring system. 3,698,249, Cl. 73-398.00r.

Webb, Larry Joe, to Honeywell Information Systems Inc., mesne. Apparatus to visually identify and test wires in a multi-wire cable. 3,699,438, Cl. 324-66.000.

Webb, Louis R. Portable cooking stove. 3,698,376, Cl. 126-9.00r.

Weber, Heinz, to Telesco Brophey Limited. Telescopic umbrella. 3,698,410, Cl. 135-26.000.

Weber, Karl F. Display panel for merchandise or the like. 3,698,565, Cl. 211-87.000.

Weber, Roland E.; and Zimmermann, Carl J. Anti-pollution device for removing debris from liquid. 3,698,558, Cl. 210-256.000.

Webley, Houston F. Vehicular anti-theft brake locking deviec and method. 3,698,505, Cl. 180-114.000.

Webre, Alfred L., Jr.: *See—*
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Webster Electric Company, Inc.: *See—*
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Webster, Ronald Kerry: *See—*
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Weger, Ronald E. Radio control and repeater communication system. 3,699,443, Cl. 325-4.000.

Weibel, Gerhard E., to Zenith Radio Corporation. Image detector including sensor matrix of field effect elements. 3,699,375, Cl. 313-95.000.

Weiberg, Ottl: *See—*

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Weiershausen, Walter: *See—*
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Weigl, John W., to Xerox Corporation. Displaying and printing apparatus. 3,698,807, Cl. 355-45.000.
Weil, William M., to LTV Aerospace Corporation. Distance ranging system. 3,698,811, Cl. 356-5.000.
Weinmann, Karl, to KAMAG Transporttechnik GmbH, & Co. Articulated vehicles. 3,698,582, Cl. 214-506.000.
Weir, Dallas M., Jr.: *See—*
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Weir, Stanley M. Reading tables. 3,698,328, Cl. 108-6.
Weiss, Robert O.; Nikitopoulos, Robert A.; and Gunther, Phillip B., to Mallory, P. R., & Co., Inc. Method of forming mercuric oxide shell on carbon particles. 3,698,959, Cl. 136-137.000.
Weissenburger, Helmut Wilhelm Otto; deceased (by Weissenburger, Ludmilla, nee Lubimowa; administrator). Process for preparing penicillin derivatives. 3,699,096, Cl. 260-239.100.
Weissenburger, Ludmilla, nee Lubimowa: *See—*
Weissenburger, Helmut Wilhelm Otto, 3,699,096.
Welch Allyn, Inc.: *See—*
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191 3,698,879
195 3,698,880
3,698,932
200HC 3,698,058
200P 3,698,060
201 3,698,056
203MM 3,698,057
203D 3,698,061
3,698,062
203H 3,698,059
205R 3,698,063
238 3,698,065
407 3,698,069
408 3,698,064
458 3,698,066
470.1 3,698,067
3,698,075
471.1 3,698,076
509 3,698,068
527.6 3,698,070
571 3,698,071
574 3,698,072
577 3,698,073
578 3,698,077
3,698,078
583 3,698,080
598 3,698,079
604 3,698,081
624 3,698,082
626 3,698,074
629 3,698,083

CLASS 30

4R 3,698,084
90.4 3,698,085
228 3,698,086
3,698,087

CLASS 32

22 3,698,088

CLASS 33

86 3,698,089
164R 3,698,090
172R 3,699,473
233 3,698,091
241 3,698,092
263 3,698,093
366 3,698,094

CLASS 34

9 3,698,095
3,698,096
3,698,097
15 3,698,098

CLASS 35

9A 3,698,100
20 3,698,101
25 3,698,102
35 3,698,103
60 3,698,104

CLASS 36

2.5AL 3,698,106
2.5R 3,698,105
11.5 3,698,107
3,698,108

CLASS 37

124 3,698,109

CLASS 38

107 3,698,110

CLASS 40

10R 3,698,111
96 3,698,112
118 3,698,113
155 3,698,114

CLASS 42

49R 3,698,115

CLASS 43

17 3,698,116
3,698,117
22 3,698,118
42.08 3,698,119
43.14 3,698,120
3,698,121

CLASS 46

17 3,698,122
29 3,698,123
30 3,698,124
118 3,698,125
119 3,698,126
126 3,698,127
135R 3,698,134
175 3,698,128
202 3,698,129
206 3,698,130

CLASS 47

29 3,698,131
41.13 3,698,132
57.6 3,698,133

CLASS 48

209 3,698,881
210 3,698,882

CLASS 49

35 3,698,135
394 3,698,136
449 3,698,883

CLASS 51

99 3,698,137
165.8 3,698,138
237R 3,698,139
241G 3,698,140
372 3,698,141

CLASS 52

29 3,698,143
58 3,698,142
73 3,698,150
99 3,698,144
144 3,698,145
214 3,698,146
276 3,698,147
400 3,698,148
731 3,698,149

CLASS 53

26 3,698,151
27 3,698,152
61 3,698,153
73 3,698,154
390 3,698,155

CLASS 55

67 3,698,156
3,698,157
227 3,698,158
257 3,698,159
385 3,698,160
493 3,698,161

CLASS 56

1 3,698,162
9 3,698,163
10.4 3,698,164
11.4 3,698,165
220 3,698,166
291 3,698,167
294 3,698,168
328 3,698,169
329 3,698,170
331 3,698,171
400 3,698,172

CLASS 57

18 3,698,173
58.89 3,698,175
58.95 3,698,174
119 3,698,176
140J 3,698,177
157TS 3,698,178

CLASS 58

28R 3,698,179
145D 3,698,180

CLASS 59

11 3,698,181

CLASS 60

24 3,698,182
26.1 3,698,183
36 3,698,184
39.02 3,698,185
39.72R 3,698,186
45 3,698,200
52US 3,698,187
52S 3,698,188
53A 3,698,189
54.6E 3,698,190
220 3,698,191
232 3,698,192

CLASS 61

1R 3,698,193
11 3,698,194
12 3,698,195
45B 3,698,196
46 3,698,197
46.5 3,698,198
72.3 3,698,199

CLASS 62

62 3,698,201
114 3,698,202
136 3,698,203
206 3,698,204
256 3,698,205
342 3,698,206
503 3,698,207

CLASS 64

11R 3,698,208
12 3,698,209

CLASS 65

43 3,698,884

CLASS 66

155 3,698,210

CLASS 68

19.2 3,698,211
178 3,698,212
205R 3,698,213
3,698,214

CLASS 70

152 3,698,215
380 3,698,216
451 3,698,217

CLASS 71

1 3,698,885
93 3,698,886
120 3,698,887

CLASS 72

10 3,698,218
38 3,698,219
60 3,698,220
62 3,698,221
129 3,698,222
146 3,698,223
178 3,698,224
208 3,698,225
239 3,698,226
263 3,698,227
306 3,698,228
341 3,698,229
386 3,698,230
391 3,698,231
482 3,698,232

CLASS 73

1B 3,698,233
15 3,698,234
17A 3,698,235
3,698,236
23.1 3,698,237
53 3,698,238
65 3,698,239
67.9 3,698,240
69 3,698,241
94 3,698,242
135 3,698,243
144 3,698,244
194B 3,698,245
258 3,698,246
388BN 3,698,247
398AR 3,698,248
398R 3,698,249
517 3,698,250

CLASS 74

1.5 3,698,252
5R 3,698,251
129 3,698,253
143 3,698,254
193 3,698,255
230.17E 3,698,256
424.8R 3,698,257
424.8 3,698,258
492 3,698,259
560 3,698,260
562 3,698,261
572 3,698,262
573 3,698,263
581 3,698,264
665GA 3,698,265

CLASS 75

67 3,698,888
123 3,698,889
147 3,698,890
206 3,698,891

CLASS 81

53A 3,698,266
185 3,698,267

CLASS 82

2B 3,698,268
38R 3,698,269

CLASS 83

11 3,698,270
99 3,698,271
3,698,272
183 3,698,273
188 3,698,274
481 3,698,275

CLASS 84

1.22 3,699,233
1.24 3,699,234
365 3,698,276
483 3,698,277

CLASS 85

70 3,698,278
71 3,698,279

CLASS 86

1R 3,698,280

CLASS 89

1B 3,698,281
1F 3,698,282
12 3,698,283
43R 3,698,284
189 3,698,285

CLASS 91

486 3,698,286
507 3,698,287

CLASS 92

13.4 3,698,288

CLASS 93

8WA -3,698,289
54R 3,698,291

CLASS 94

18 3,698,292
31 3,698,290
50V 3,698,293

CLASS 95

1R 3,698,295
1 3,698,294
4.5R 3,698,297
4.5 3,698,296
10CE 3,698,298
10CT 3,698,299
3,698,300
3,698,302
10C 3,698,301
22 3,698,303
42 3,698,305
53EB 3,698,304
93 3,698,307
94 3,698,306

CLASS 96

1.1 3,698,892
3,698,893
1.5 3,698,894
1.8 3,698,895
3 3,698,896
3,698,897
3,698,898
27 3,698,899
29 3,698,900
33 3,698,901
35 3,698,902
36.1 3,698,903
44 3,698,906
48R 3,698,905
48 3,698,904
84R 3,698,907
3,698,908
91 3,699,000
100 3,698,909
122 3,698,910

CLASS 98

99R 3,698,308

CLASS 99

6 3,698,911
14 3,698,912
34 3,698,913
83 3,698,914
100P 3,698,915
109 3,698,916
116 3,698,918
141 3,698,917
450.1 3,698,309

CLASS 100

4 3,698,310
158C 3,698,311

CLASS 101

142 3,698,312
350 3,698,313
426 3,698,314

CLASS 102

8 3,698,315
27 3,698,316
37.4 3,698,317
37.8 3,698,318
45 3,698,319
49.3 3,698,320
3,698,321
56 3,698,322
70.2R 3,698,323

CLASS 104

9 3,698,324

CLASS 105

61 3,698,325
156 3,698,326

CLASS 106

1 3,698,919
41 3,698,920
54 3,698,921
58 3,698,922
62 3,698,923
89 3,698,924

CLASS 108

2 3,698,327
6 3,698,328
42 3,698,329
44 3,698,330

CLASS 110

7R 3,698,331

CLASS 111

77 3,698,332

CLASS 112

189 3,698,333
220 3,698,334
243 3,698,335
252 3,698,336

CLASS 113

120AA 3,698,337

CLASS 114

15 3,698,338
16R 3,698,339
40 3,698,340
3,698,341
66.5P 3,698,343
66.5R 3,698,342
77R 3,698,344
125 3,698,345
201 3,698,346
202 3,698,347
235B 3,698,348
235R 3,698,349

CLASS 115

1R 3,698,350

CLASS 116

70 3,698,351
86 3,698,352
129A 3,698,353

CLASS 117

2R 3,698,925
17.5 3,698,926
33.3 3,698,927
45 3,698,928
3,698,930
47R 3,698,931
53 3,698,943
71R 3,698,929
72 3,698,933
76P 3,698,934
76T 3,698,935
105.2 3,698,936
113 3,698,937
114A 3,698,938
123A 3,698,942
130E 3,698,939
201 3,698,944
3,698,945

211 3,698,946
212 3,698,940
3,698,941
3,698,947
213 3,698,948

CLASS 118

49.1 3,698,354
411 3,698,355
636 3,698,357
637 3,698,356

CLASS 119

2 3,698,358
3 3,698,359
17 3,698,360
51.11 3,698,361

CLASS 122

136R 3,698,362
406S 3,698,363

CLASS 123

8.09 3,698,364
32G 3,698,373
100 3,699,207
117A 3,698,366
120 3,698,367
121 3,698,365
139AJ 3,698,368
140R 3,698,369
193CP 3,698,370
198DB 3,698,372
198F 3,698,371

CLASS 124

11 3,698,374
24 3,698,375
52 3,699,220

CLASS 126

9R 3,698,376
21A 3,698,377
39R 3,698,378
59.5 3,698,379
271.2A 3,698,380

CLASS 127

9 3,698,949
46R 3,698,950
48 3,698,951

CLASS 128

1R 3,698,381
2G 3,698,383
2N 3,698,385
2R 3,698,382
2.06A 3,698,386
2.07 3,698,384
9 3,698,387
62A 3,698,388
77 3,698,389
222 3,698,390
261 3,698,391
268 3,698,392
296 3,698,393
303.1 3,698,394
335 3,698,395
347 3,698,396
399 3,698,397
422 3,698,398
483 3,698,399

CLASS 131

185 3,698,400
235R 3,698,401

CLASS 132

37R 3,698,402
46R 3,698,403
79R 3,698,404
84 3,698,405

CLASS 134

22R 3,698,952
57D 3,698,406
60 3,698,407
122 3,698,408

CLASS 135

6 3,698,409
26 3,698,410

CLASS 136

20 3,698,953
83R 3,698,955
86A 3,698,956
86C 3,698,957
89 3,698,958
137 3,698,959
153 3,698,960
170 3,698,961
234 3,698,954

CLASS 137

71 3,698,411
81 3,698,412
81.5 3,698,413
85 3,698,414
102 3,698,415
119 3,698,416
212 3,698,417
315 3,698,418
318 3,698,419
329.06 3,698,420
356 3,698,421
375 3,698,422
454.2 3,698,423
467 3,698,424
505.25 3,698,425
512.1 3,698,426
542 3,698,427
595 3,698,428
601 3,698,429
604 3,698,430
3,698,431
608 3,698,432
615 3,698,433
624.15 3,698,436
624.27 3,698,434
625.18 3,698,435
625.46 3,698,438
625.48 3,698,439
625.62 3,698,437

CLASS 138

149 3,698,440

CLASS 139

54 3,698,441
127P 3,698,442
142 3,698,444
159 3,698,443
185 3,698,445
303 3,698,447
308 3,698,446

CLASS 140

3CA 3,698,448

CLASS 141

1 3,698,449
85 3,698,450
166 3,698,451
286 3,698,452
349 3,698,453
375 3,698,454

CLASS 143

32R 3,698,455

CLASS 144

28.11 3,698,456
34R 3,698,457

CLASS 146

2R 3,698,458
119 3,698,459
180 3,698,460

CLASS 148

11.5F 3,698,962
12.4 3,698,963
31.5 3,698,964
32.5 3,698,965
187 3,698,966

CLASS 149

19 3,698,967
3,698,968
3,698,969

CLASS 152

5 3,698,461
209 3,698,462
379 3,698,463

CLASS 156

3 3,698,970
64 3,698,971
71 3,698,972
78 3,698,973
87 3,698,974
96 3,698,975
155 3,698,976
210 3,698,977
219 3,698,978
244 3,698,979
282 3,698,980
293 3,698,981
308 3,698,982
3,698,983
330 3,698,984
379 3,698,985
393 3,698,986
401 3,698,987
428 3,698,988
479 3,698,989
522 3,698,990

CLASS 160

188 3,698,464
222 3,698,465

CLASS 161

6 3,698,472
14 3,698,991
159 3,698,993
178 3,698,994

CLASS 162

19 3,698,995

CLASS 164

55 3,698,466
132 3,698,467
255 3,698,468
274 3,698,469
281 3,698,470
340 3,698,471

CLASS 165

51 3,698,473
3,698,992
112 3,698,476
171 3,698,475

CLASS 166

90 3,698,474
214 3,698,477
248 3,698,478
273 3,698,479

CLASS 169

1A 3,698,480
16 3,698,481
3,698,482
37 3,698,483

CLASS 172

40 3,698,484
65 3,698,485
212 3,698,486
305 3,698,487
311 3,698,488
656 3,698,489
803 3,698,490

CLASS 174

48 3,699,235
66 3,699,236
101.5 3,699,237
115 3,699,238

CLASS 175

329 3,698,491

CLASS 176

19LD 3,698,996

CLASS 177

1 3,698,492
3 3,698,493
118 3,698,494
170.2 3,699,273
211 3,698,495
230 3,698,496

CLASS 178

4.2 3,699,251
5.4AC 3,699,241
5.4BD 3,699,242
5.4CD 3,699,243
5.4TE 3,699,239
5.4P 3,699,240
5.4R 3,699,244
6 3,699,245
6.6DC 3,699,246
6.6FS 3,699,247
6.6R 3,699,249
6.8 3,699,248
3,699,250
7.2 3,699,252
3,699,258
19 3,699,253
66R 3,699,254
69M 3,699,255
69.5CB 3,699,257
69.5TV 3,699,256

CLASS 179

6.5 3,699,259
15BS 3,699,260
3,699,261
18BC 3,699,264
18ET 3,699,262
18FF 3,699,263
19 3,699,265
100.2E 3,699,267
3,699,269
100.2Z 3,699,266
100.41K 3,699,268
158 3,699,270
170F 3,699,272
170.8 3,699,271
175 3,699,274

CLASS 180

5R 3,698,497
6.2 3,698,498
3,698,499
6.7 3,698,500
8A 3,698,501
27 3,698,502
33R 3,698,503
52 3,698,504
114 3,698,505
118 3,698,506
119 3,698,507

CLASS 181

.5H 3,698,508
33HA 3,698,509
36A 3,698,510

CLASS 182

113 3,698,511
164 3,698,512

CLASS 184

5 3,698,513
6.23 3,698,515
6.4 3,698,514
39 3,698,516

CLASS 186

1A 3,698,517

CLASS 188

72.5 3,698,518
73.2 3,698,519
171 3,698,520
306 3,698,521

CLASS 190

41R 3,698,522

CLASS 191

29 3,699,275

CLASS 192

.075 3,698,525
12BA 3,698,523
18A 3,698,524
107M 3,698,526
129A 3,698,527

CLASS 195

28R 3,698,997
28 3,698,998
29 3,698,999
66R 3,699,001
66 3,699,002
103.5R 3,699,003
3,699,004
3,699,005

CLASS 197

1 3,698,528
49 3,698,529
71 3,698,530
98 3,698,531
100 3,698,532
3,698,533

CLASS 198

9 3,698,534
16R 3,698,535
26 3,698,536
33AA 3,698,537
33AD 3,698,538
127 3,698,539
202 3,698,540
214 3,698,541
225 3,698,542

CLASS 200

11G 3,699,279
16A 3,699,276
3,699,280
38A 3,699,282
38R 3,699,277
3,699,278
3,699,281
47 3,699,283
51.04 3,699,284
51.09 3,699,285
61.34 3,699,286
61.45R 3,699,287
67DB 3,699,296
80R 3,699,288
148R 3,699,289
150L 3,699,290
153L 3,699,291
166C 3,699,294
166H 3,699,293
166J 3,699,292
175 3,699,295

CLASS 203

4 3,699,006
40 3,699,007
72 3,699,008

CLASS 204

15 3,699,010
3,699,011
29 3,699,012
32R 3,699,013
35R 3,698,014
3,698,015
3,699,014
3,699,015
49 3,699,016
3,699,017
52R 3,698,018
3,699,018
58 3,699,019
73 3,699,020
146 3,699,021
159.14 3,699,025
159.15 3,699,022
159.19 3,699,023
159.22 3,699,024
159.23 3,699,026
164 3,699,027
180G 3,698,033
3,699,033
180R 3,698,028
3,699,028
181 3,699,009
3,699,029
3,699,030
3,699,031
192 3,699,034
195S 3,698,032
3,699,032

CLASS 206

42 3,698,543
45.11 3,698,544
46H 3,698,545
52W 3,698,546
57A 3,698,547
58 3,698,548
63.2R 3,698,549
65E 3,698,550
80R 3,698,551

CLASS 208

92 3,699,035
111 3,699,036
120 3,699,037

CLASS 209

102 3,698,552
173 3,698,553

CLASS 210

23 3,699,038
28 3,699,039
32 3,699,040
80 3,698,554
138 3,698,555
178 3,698,556
225 3,698,557
256 3,698,558
321 3,698,559
3,698,560
445 3,698,561
488 3,698,562

CLASS 211

13 3,698,563
86 3,698,564
87 3,698,565
176 3,698,566
183 3,698,567
184 3,698,568

CLASS 212

144 3,698,569

CLASS 213

146 3,698,570
153 3,698,571

CLASS 214

6DK 3,698,572
15B 3,698,573
17CB 3,698,574
17DB 3,698,575
17C 3,698,576
38BA 3,698,577
58 3,698,578
83.1 3,698,579
138R 3,698,580
394 3,698,581
506 3,698,582
764 3,698,583

CLASS 215

9 3,698,584
3,698,585
12R 3,698,586

CLASS 219

9.5 3,699,297
10.49 3,699,298
10.55 3,699,299
3,699,300
10.57 3,699,302
69C 3,699,301
69D 3,699,303
121EB 3,699,304
200 3,699,305
241 3,699,306
492 3,699,307
546 3,699,308
553 3,699,309

CLASS 220

9C 3,698,588
9F 3,698,587
14 3,698,589
27 3,698,590
46R 3,698,591
55Z 3,698,592
60A 3,698,593
63R 3,698,595
63 3,698,594
67 3,698,596
86 3,698,597
89A 3,698,598

CLASS 221

25 3,698,599
70 3,698,600
105 3,698,601
225 3,698,602

CLASS 222

146R 3,698,603
182 3,698,604
190 3,698,605
454 3,698,606

CLASS 223

2 3,698,626
96 3,698,607

CLASS 224

6 3,698,608
42.05 3,698,609

CLASS 226

7 3,698,610
50 3,698,611
91 3,698,612
118 3,698,613
193 3,698,614
194 3,698,615

CLASS 227

3 3,698,616

CLASS 228

2 3,698,617
3 3,698,618
4 3,698,621
5 3,698,622
6 3,698,619
3,698,620

CLASS 229

2.5 3,698,623
23R 3,698,624
52B 3,698,625

CLASS 235

30R 3,698,627
60R 3,698,628
61.11E 3,698,312
61.11H 3,699,311
61.5D 3,699,310
63G 3,698,629
64.3 3,699,313
78 3,698,630
3,699,314
92FL 3,699,315
150.25 3,699,316
150.27 3,699,324
151.1 3,699,318
151.11 3,699,317
151.34 3,699,319
3,699,320
152 3,698,631
3,699,321
153 3,699,322
3,699,323
154 3,699,325
175 3,699,326
201PF 3,698,632

CLASS 236

99 3,698,633

CLASS 238

152 3,698,634

CLASS 239

3 3,698,635
15 3,698,636
68 3,698,637
75 3,698,638
124 3,698,639
187 3,698,640
265.23 3,698,642
299 3,698,643
318 3,698,644
434 3,698,641
573 3,698,645
591 3,698,646

CLASS 240

41.3 3,699,327
52.1 3,699,328

CLASS 241

24 3,698,647
33 3,698,648
44 3,698,649
51 3,698,650

CLASS 242

7.23 3,698,651
25A 3,698,652
55.3 3,698,653
74 3,698,654
76 3,698,655
106 3,698,656
107.4 3,698,657
192 3,698,658

CLASS 244

1SA 3,698,661
1SS 3,698,659
1R 3,698,660
7A 3,698,662
3,698,666
17.27 3,698,663
32 3,698,667
42DA 3,698,664
44 3,698,668
77A 3,698,669
77M 3,698,665
122AG 3,698,670
155R 3,698,671

CLASS 246

182 3,699,329

CLASS 248

4 3,698,672
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